DRINKING WATER SURVEILLANCE PROGRAM

OWEN SOUND WATER SUPPLY SYSTEM

ANNUAL REPORT 1990

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OWEN SOUND
WATER SUPPLY SYSTEM

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EXECUTIVE SUMMARY

DRINKING WATER SURVEILLANCE PROGRAM

OWEN SOUND WATER SUPPLY SYSTEM
1990 ANNUAL REPORT

The Drinking Water Surveillance Program (DWSP) for Ontario is a monitoring program providing immediate, reliable, current information on drinking water quality. The DWSP officially began in April 1986 and is designed to eventually include all municipal supplies in Ontario. In 1990, 76 systems were being monitored.

The Owen Sound water supply system consists of a direct filtration plant which treats water from Georgian Bay. This process consists of coagulation, flocculation, filtration, fluoridation and disinfection. This plant has a rated capacity of 22.727 x 1000 m^3/day. The Owen Sound spring supply is used as an additional source and, once chlorinated, makes up 25% of the water supplied to Owen Sound. The combined sources serve a population of approximately 20,000.

Water at the plant and the spring raw water, together with two locations in the distribution system, each served by one of the sources, was sampled for the presence of approximately 180 parameters. Parameters were divided into the following groups: bacteriological, inorganic and physical (laboratory chemistry, field chemistry and metals), and organic (chloroaromatics, chlorophenols, pesticides and PCB, phenolics, polyaromatic hydrocarbons, specific pesticides and volatiles). Samples were analyzed for specific pesticides and chlorophenols twice a year in the spring and fall.

Table A (one for each source) is a summary of all results by group.

The Owen Sound water treatment plant, and the Owen Sound spring supply, for the sample year 1990, produced good quality water and this was maintained in the distribution system.

No known health related guidelines were exceeded.

TABLE A

DRINKING WATER SURVEILLANCE PROGRAM OWEN SOUND (RICHARD H. HEATH WTP)

SUMMARY TABLE BY SCAN

A POSITIVE VALUE DENOTES THAT THE RESULT IS GREATER THAN THE STATISTICAL LIMIT OF DETECTION AND IS QUANTIFIABLE
A '.' INDICATES THAT NO SAMPLE WAS TAKEN

SCAN	SITE RAW TESTS	POSITIVE	%POSITIVE	TREATED TESTS	POSITIVE	%POSITIVE	SITE 1 TESTS	POSITIVE	%POSITIVE
BACTERIOLOGICAL	30	23	76	10	1	10	10	1	10
CHEMISTRY (FLD)	29	29	100	59	59	100	103	100	97
CHEMISTRY (LAB)	220	169	76	217	159	73	375	315	84
METALS	240	57	23	240	43	17	460	139	30
CHLOROAROMATICS	126	0	0	126	0	0	98	0	0
CHLOROPHENOLS	12	0	0	12	0	0	.	.	.
PAH	152	0	0	152	0	0	34	0	0
PESTICIDES & PCB	322	0	0	322	0	0	150	1	0
PHENOLICS	10	1	10	10	0	0	.	.	.
SPECIFIC PESTICIDES	51	0	0	53	0	0	7	0	0
VOLATILES	290	0	0	290	40	13	290	40	13
TOTAL	1482	279		1491	302		1527	596	

TABLE A

DRINKING WATER SURVEILLANCE PROGRAM OWEN SOUND SPRING SUPPLY

SUMMARY TABLE BY SCAN

A POSITIVE VALUE DENOTES THAT THE RESULT IS GREATER THAN THE STATISTICAL LIMIT OF DETECTION AND IS QUANTIFIABLE
A '.' INDICATES THAT NO SAMPLE WAS TAKEN

SCAN	SITE RAW TESTS	POSITIVE	%POSITIVE	SITE 1 TESTS	POSITIVE	%POSITIVE
BACTERIOLOGICAL	33	16	48	11	6	54
CHEMISTRY (FLD)	29	29	100	59	47	79
CHEMISTRY (LAB)	242	179	73	341	293	85
METALS	264	81	30	414	157	37
CHLOROAROMATICS	126	0	0	112	0	0
CHLOROPHENOLS	12	0	0	.	.	.
PAH	168	0	0	50	0	0
PESTICIDES & PCB	335	0	0	170	0	0
PHENOLICS	11	1	9	.	.	.
SPECIFIC PESTICIDES	53	0	0	8	0	0
VOLATILES	319	0	0	290	39	13
TOTAL	1592	306		1455	542	

DRINKING WATER SURVEILLANCE PROGRAM

OWEN SOUND (WATER SUPPLY SYSTEM)
1990 ANNUAL REPORT

INTRODUCTION

The Drinking Water Surveillance Program (DWSP) for Ontario is a monitoring program providing immediate, reliable, current information on drinking water quality. The DWSP officially began in April 1986 and is designed to eventually include all municipal supplies in Ontario. In 1990, 76 systems were being monitored.

Appendix A has a full description of the DWSP.

The DWSP was initiated for the Owen Sound water supply system in February 1990. This is the first DWSP annual report.

PLANT DESCRIPTION

The Owen Sound water supply system is made up of two water sources. The primary source is a water treatment plant which treats water from Georgian Bay. The treatment process of this direct filtration plant consists of coagulation, flocculation, filtration, fluoridation and disinfection. This plant has a rated capacity of 22.7 x 1000 m^3/day. The Owen Sound spring system uses water collected in Derby Township to the south of Owen Sound. This water is collected using "penstocks" along the face of the Niagara Escarpment, it is chlorinated, fluoridated, and flows by gravity to the city. Approximately two thirds of this water is unfiltered and the other third, which is subjected to periodic run-off, is directed through a slow sand filter. The spring source makes up 25% of the water supplied to Owen Sound. The combined sources serve a population of approximately 20,000.

The sample day flows for the water treatment plant ranged from 11.06 x 1000 m^3/day to 12.27 x 1000 m^3/day.

Sample day flows for the spring supply ranged from 3.72 x 1000 m^3/day to 4.33 x 1000 m^3/day.

General information for the treatment plant is presented in Table 1 and a schematic of processes, chemical addition points and sampling locations in Figure 1.

SAMPLING AND ANALYSES

Sample lines in the plant were flushed prior to sampling to ensure that the water obtained was indicative of its origin and not residual water standing in the sample line.

At all distribution system locations two types of samples were obtained, a standing and a free flow. The standing sample consisted of water that had been in the household plumbing and service connection for a minimum of six hours. These samples were used to make an assessment of the change in the levels of inorganic compounds and metals, due to leaching from, or deposition on, the plumbing system. The only analyses carried out on the standing samples therefore, were General Chemistry and Metals. The free flow sample represented fresh water from the distribution main, since the sample tap was flushed for five minutes prior to sampling.

Attempts were made to capture the same block of water at each sampling point by taking the retention time into consideration. Retention time was calculated by dividing the volume of water between two sampling points by sample day flow. For example, if it was determined that retention time within the plant was five hours, then there would be a five hour interval between the raw and treated sampling. Similarly, if it was estimated that it took approximately one day for the water to travel from the plant to the distribution system site, this site would be sampled one day after the treated water from the plant.

Stringent DWSP sampling protocols were followed to ensure that all samples were taken in a uniform manner (see Appendix B).

Plant operating personnel routinely analyze parameters for process control (Table 2).

Water at the plant and at one location in the distribution system was sampled for the presence of approximately 180 parameters. Parameters were divided into the following groups: bacteriological, inorganic and physical (laboratory chemistry, field chemistry and metals), and organic (chloroaromatics, chlorophenols, pesticides and PCB, phenolics, polyaromatic hydrocarbons, specific pesticides and volatiles). Samples were analyzed for specific pesticides and chlorophenols twice a year in the spring and fall. Laboratory analyses were conducted at the Ministry of the Environment facilities in Rexdale, Ontario.

RESULTS

Field measurements were recorded on the day of sampling and were entered onto the DWSP database as submitted by plant personnel.

Table 3 contains information on delay time between raw and treated water sampling, flow rate, and treatment chemical dosages.

Table 4 is a summary break-down of the number of water samples analyzed by parameter and by water type. The number of times that a positive or trace result was detected is also reported.

Positive denotes that the result is greater than the statistical limit of detection established by the Ministry of the Environment laboratory staff and is quantifiable. Trace (<T) denotes that the level measured is greater than the lowest value detectable by the method but lies so close to the detection limit that it cannot be confidently quantified.

Table 5 presents the results for parameters detected on at least one occasion.

Table 6 lists all parameters analyzed in the DWSP.

Associated guidelines and detection limits are also supplied on Tables 5 and 6. Parameters are listed alphabetically within each scan.

DISCUSSION

GENERAL

Water quality was judged by comparison with the Ontario Drinking Water Objectives publication (ODWOs). When an Ontario Drinking Water Objective (ODWO) was not available, guidelines/limits from other agencies were used. These guidelines were obtained from the Parameter Listing System database.

IN THIS REPORT, DISCUSSION IS LIMITED TO:

- **THE TREATED AND DISTRIBUTED WATER;**
- **ONLY THOSE PARAMETERS WITH CONCENTRATIONS ABOVE GUIDELINE VALUES; AND**
- **POSITIVE ORGANIC PARAMETERS DETECTED.**

BACTERIOLOGICAL

Guidelines for bacteriological sampling and testing of a supply are developed to maintain a proper supervision of its bacteriological quality. Routine monitoring programs usually require that multiple samples be collected in a given system. Full interpretation of bacteriological quality cannot be made on the basis of single samples.

Standard plate count is a test used to supplement routine analysis for coliform bacteria. The limit for standard plate count (at 35°C

after 48 hours) in the ODWOs is 500 counts/mL (based on a geometric mean of 5 or more samples). DWSP bacteriological analysis of treated and distributed water was limited to standard plate count, which may indicate some deterioration in water quality if the guideline of 500 counts/mL is exceeded.

Standard plate count (membrane filtration) exceeded the ODWO Maximum Desirable Concentration of 500 counts/mL in 2 of 9 distributed water samples from the spring source with a maximum reported value of 2.400 counts/mL.

INORGANIC & PHYSICAL

CHEMISTRY (FIELD)

It is desirable that the temperature of drinking water be less than 15°C. The palatability of water is enhanced by its coolness. A temperature below 15°C will tend to reduce the growth of nuisance organisms and hence minimize associated taste, colour, odour and corrosion problems. The temperature of the delivered water may increase in the distribution system due to the warming effect of the soil in late summer and fall and/or as a result of higher temperatures in the source water.

Field temperature exceeded the ODWO Maximum Desirable Concentration of 15°C in 3 of 26 treated and distributed water samples from both sources with a maximum reported value of 19.5°C.

CHEMISTRY (LAB)

The ODWOs indicate that a hardness level of between 80 and 100 mg/L as calcium carbonate for domestic waters provides an acceptable balance between corrosion and encrustation. Water supplies with a hardness greater than 200 mg/L are considered poor and would possess a tendency to form scale deposits and result in excessive soap consumption.

Hardness exceeded the ODWO Aesthetic or Recommended Operational Guideline of 80-100 mg/L in 9 of 18 plant treated and its associated distributed water samples with a maximum reported value of 133.6 mg/L.

Hardness levels in the distribution site supplied by the spring supply ranged from 311.0 mg/L to 353.3 mg/L. Supplies with a hardness greater than 200 mg/L are considered of poor quality.

Elevated conductivity is often associated with high hardness levels.

Conductivity exceeded the European Economic Community Aesthetic Guideline Level of 400 umho/cm in all 9 water samples from the distribution site supplied by the spring with a maximum reported level of 642.0 umho/cm.

PH exceeded the ODWO Aesthetic or Recommended Operational Guideline of 6.5-8.5 pH units in 1 of 9 water samples from the distribution site supplied by the spring with a reported value of 8.51 pH units. The field pH did not confirm this elevated value.

Sodium silicofluoride was added at both supplies, but the dosages were usually inadequate to achieve the recommended fluoride concentration range of 1.0 to 1.4 mg/L.

METALS

At present, there is no evidence that aluminum is physiologically harmful and no health limit for drinking water has been specified. The measure of aluminum in treated water is important to indicate the efficiency of the treatment process. The ODWOs indicate that a useful guideline is to maintain a residual below 100 ug/L as aluminum in the water leaving the plant, to avoid problems in the distribution system.

Aluminum exceeded the ODWO Aesthetic or Recommended Operational Guideline of 100 ug/L in 2 of 9 plant treated water samples with a maximum reported value of 140.0 ug/L.

Elevated copper levels were found in the free flowing distribution site samples associated with the spring. This was unexpected, since the water appeared non-corrosive on the basis of water quality results.

ORGANIC

CHLOROAROMATICS

Hexachlorocyclopentadiene was found at positive levels in 1 of 6 treated and distributed water samples associated with the water plant with a reported value of 60.0 ng/L. The United States Environmental Protection Agency Ambient Water Quality Criteria for hexachlorocyclopentadiene is 206,000 ng/L.

The results of the other parameters in the chloroaromatic scan showed that none were detected above trace levels.

CHLOROPHENOLS

The results of the chlorophenol scan showed that none were detected.

POLYAROMATIC HYDROCARBONS (PAH)

Phenanthrene was reported at trace levels in 4 of 5 water samples from both distribution system locations, but none were detected in the raw or treated water. It is suspected that the source is water mains lined with coal tar compounds.

PESTICIDES & PCB

The results of the PCB scan showed that none were detected.

The results of the regular pesticide scan showed that none were detected above trace levels.

PHENOLICS

Phenolic compounds are present in the aquatic environment as a result of natural and/or industrial processes. The ODWOs recommend, as an operational guideline, that phenolic substances in drinking water not exceed 2.0 ug/L. This limit has been set primarily to prevent undesirable taste and odours, particularly in chlorinated water. No results were reported above trace levels.

SPECIFIC PESTICIDES

The results of the specific pesticides scan showed that none were detected.

VOLATILES

The detection of benzene, ethylbenzene, toluene and xylenes at low, trace levels may be a laboratory artifact derived from the analytical methodology.

Toluene was found at positive levels in 1 of the 18 treated and distributed water samples associated with the water plant with a reported value of 0.55 ug/L. This result was thought to be caused by contamination. The ODWO Aesthetic Objective for toluene is 24 ug/L.

1,1 Dichloroethane was detected at trace levels in all 9 water samples at the distribution site supplied by the spring source.

1,1,1 Trichloroethane was detected at trace levels in all 9 water samples at the distribution site supplied by the spring source.

Trihalomethanes (THMs) are produced during the water treatment process and will always occur in chlorinated waters. THMs are comprised of chloroform, chlorodibromomethane and dichlorobromomethane; bromoform occurs occasionally. Results are reported for the individual compounds as well as for total THMs.

Total THMs were found at positive levels in all 27 treated and distributed water samples analyzed from both sources. The maximum observed level was 68.7 ug/L. This was below the ODWO Maximum Acceptable Concentration of 350 ug/L.

CONCLUSIONS

The Owen Sound water treatment plant and the Owen Sound spring system, for the sample year 1990, produced good quality water and this was maintained in the distribution system.

No known health related guidelines were exceeded.

FIGURE 1

OWEN SOUND WTP

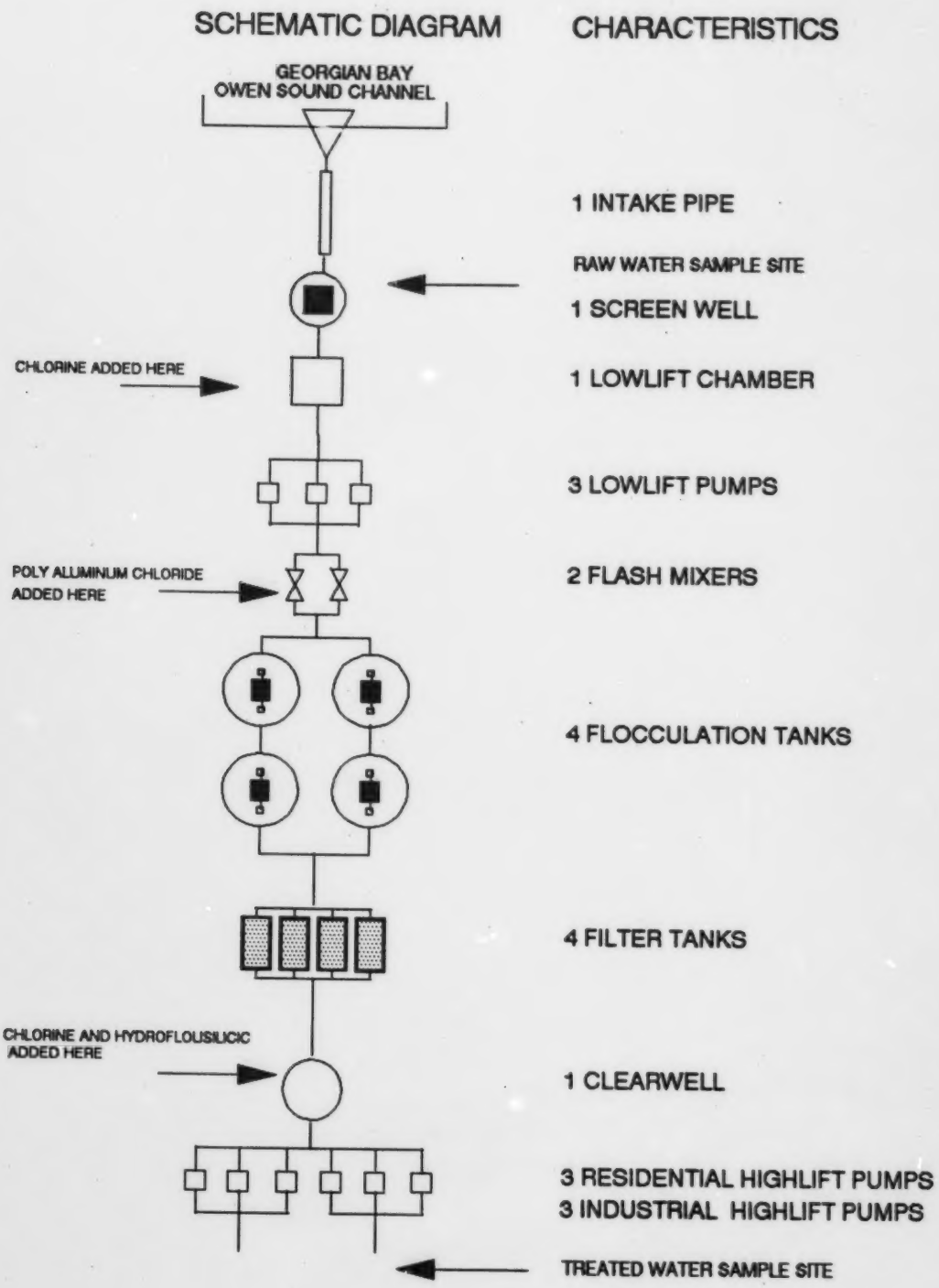

TABLE 1

DRINKING WATER SURVEILLANCE PROGRAM

PLANT GENERAL REPORT

WORKS #: 220001799
PLANT NAME: OWEN SOUND (RICHARD H. NEATH WTP)

DISTRICT: OWEN SOUND
REGION: SOUTHWEST
DISTRICT OFFICER :H.W. PAGE

UTM #: 175053454936815

PLANT SUPERINTENDENT: MR WAYNE CARMICHAEL

ADDRESS: 2600 THIRD AVENUE EAST
OWEN SOUND,ONTARIO
N4K 2M6
(519 376 4530)

MUNICIPALITY: OWEN SOUND
AUTHORITY: MUNICIPAL

PLANT INFORMATION

PLANT VOLUME:	3.114	(X 1000 M3)
DESIGN CAPACITY:	30.909	(X 1000 M3/DAY)
RATED CAPACITY:	22.727	(X 1000 M3/DAY)

MUNICIPALITY	POPULATION
OWEN SOUND	20,000

TABLE 2
DRINKING WATER SURVEILLANCE PROGRAM
IN-PLANT MONITORING
OWEN SOUND (RICHARD H. NEATH WTP)

PARAMETER	LOCATION	FREQUENCY
ALUMINUM	CHLORINE EFFLUENT	WEEKLY
COMBINED CHLORINE RESIDUAL	CHLORINE EFFLUENT	HOURLY
	LOWLIFT DISCHARGE	HOURLY
	AFTER SETTLING TANKS	HOURLY
TOTAL CHLORINE RESIDUAL	CHLORINE EFFLUENT	HOURLY
	LOWLIFT DISCHARGE	HOURLY
	AFTER SETTLING TANKS	HOURLY
FLUORIDE	CHLORINE EFFLUENT	DAILY
TEMPERATURE	RAW WATER	TWICE DAILY
	TREATED WATER	TWICE DAILY
TURBIDITY	TREATED WATER IN LAB	TWICE DAILY
	CHLORINE EFFLUENT	CONTINUOUS
	RAW WATER IN LAB	TWICE DAILY
	RAW WATER	CONTINUOUS

TABLE 3

DRINKING WATER SURVEILLANCE PROGRAM OWEN SOUND (RICHARD H. NEATH WTP) SAMPLE DAY CONDITIONS 1990

			TREATMENT CHEMICAL DOSAGE (MG/L)		
			PRE CHLORINATION	COAGULATION	FLUORIDATION
			CHLORINE	POLY ALUMINUM CHLORIDE	SODIUM SILICOFLUORIDE
DATE	DELAY * TIME(HRS)	FLOW (1000M3)			
FEB 27	.50	11.069		3.50	
MAR 26	.50	11.111		3.50	
APR 25	.00	11.538		3.50	
MAY 23	.00	12.271		3.50	
OCT 01	1.45	11.655	1.01		.91

* THE DELAY TIME BETWEEN THE RAW AND TREATED WATER SAMPLING, SHOULD ESTIMATE THE RETENTION TIME.

TABLE 3

DRINKING WATER SURVEILLANCE PROGRAM OWEN SOUND (SPRING SYSTEM) SAMPLE DAY CONDITIONS 1990

			TREATMENT CHEMICAL DOSAGE (MG/L)	
			PRE CHLORINATION	FLUORIDATION
			CHLORINE	SODIUM SILICOFLUORIDE
DATE	DELAY * TIME(HRS)	FLOW (1000M3)		
FEB 27	.00	3.738	0.85	
MAR 26	.00	4.188	0.85	
APR 25	.00	0.000	0.85	
MAY 23	.00	4.261	0.85	
JUN 27	.00	4.119	0.85	
JUL 25	.00	4.261	0.85	
AUG 29	.00	4.042	0.85	
OCT 01	.00	3.858	0.85	
OCT 24	.00	3.837	0.85	
NOV 26	.00	4.586	0.85	
DEC 17	.00	4.356	0.85	

* THE DELAY TIME BETWEEN THE RAW AND TREATED WATER SAMPLING, SHOULD ESTIMATE THE RETENTION TIME.

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM OWEN SOUND (RICHARD H. HEATH WTP)
SUMMARY TABLE OF RESULTS (1990)

SCAN PARAMETER	RAW TOTAL	RAW POSITIVE	RAW TRACE	TREATED TOTAL	TREATED POSITIVE	TREATED TRACE	SITE 1 TOTAL	SITE 1 POSITIVE	SITE 1 TRACE
BACTERIOLOGICAL									
FECAL COLIFORM MF	10	7	0	.	.	.	.	.	.
STANDRD PLATE CNT MF	.	.	.	10	1	0	10	1	0
TOTAL COLIFORM MF	10	7	0	.	.	.	.	.	.
T COLIFORM BCKGRD MF	10	9	0	.	.	.	.	.	.
*TOTAL SCAN BACTERIOLOGICAL	30	23	0	10	1	0	10	1	0
CHEMISTRY (FLD)									
FLD CHLORINE (COMB)	.	.	.	9	9	0	16	13	0
FLD CHLORINE FREE	.	.	.	10	10	0	18	18	0
FLD CHLORINE (TOTAL)	.	.	.	10	10	0	18	18	0
FLD PH	10	10	0	10	10	0	20	20	0
FLD TEMPERATURE	10	10	0	10	10	0	18	18	0
FLD TURBIDITY	9	9	0	10	10	0	13	13	0
*TOTAL SCAN CHEMISTRY (FLD)	29	29	0	59	59	0	103	100	0
CHEMISTRY (LAB)									
ALKALINITY	10	10	0	10	10	0	20	20	0
CALCIUM	10	10	0	10	10	0	20	20	0
CYANIDE	10	0	0	10	0	0	.	.	.
CHLORIDE	10	10	0	10	10	0	20	19	1
COLOUR	10	4	6	10	0	6	20	2	16
CONDUCTIVITY	10	10	0	10	10	0	20	20	0
DISS ORG CARBON	10	10	0	10	10	0	20	20	0
FLUORIDE	10	10	0	10	10	0	20	20	0
HARDNESS	10	10	0	10	10	0	20	20	0
IONCAL	10	10	0	10	10	0	20	20	0
LANGELIERS INDEX	10	10	0	7	7	0	16	16	0
MAGNESIUM	10	10	0	10	10	0	20	20	0
SODIUM	10	10	0	10	10	0	20	20	0
AMMONIUM TOTAL	10	2	4	10	1	1	20	1	5
NITRITE	10	2	8	10	2	3	20	3	9
TOTAL NITRATES	10	10	0	10	10	0	20	19	1
NITROGEN TOT KJELD	10	9	1	10	9	1	19	18	1
PH	10	10	0	10	10	0	20	20	0
PHOSPHORUS FIL REACT	10	0	7	10	0	2	.	.	.
PHOSPHORUS TOTAL	10	2	6	10	1	2	.	.	.
SULPHATE	10	10	0	10	10	0	20	20	0
TURBIDITY	10	10	0	10	9	1	20	17	3
*TOTAL SCAN CHEMISTRY (LAB)	220	169	32	217	159	16	375	315	36

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM OWEN SOUND (RICHARD H. HEATH WTP)
SUMMARY TABLE OF RESULTS (1990)

SCAN PARAMETER	RAW			TREATED			SITE 1		
	TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE
METALS									
SILVER	10	0	0	10	0	1	20	0	1
ALUMINUM	10	10	0	10	10	0	20	20	0
ARSENIC	10	0	10	10	0	6	20	0	13
BARIUM	10	10	0	10	10	0	20	20	0
BORON	10	4	6	10	3	7	20	6	14
BERYLLIUM	10	0	1	10	0	2	20	0	2
CADMIUM	10	0	0	10	0	0	20	0	1
COBALT	10	0	10	10	0	8	20	0	15
CHROMIUM	10	0	8	10	0	8	20	0	13
COPPER	10	1	9	10	0	10	20	15	5
IRON	10	1	8	10	0	0	20	0	11
MERCURY	10	0	0	10	0	0	.	.	.
MANGANESE	10	10	0	10	0	10	20	20	0
MOLYBDENUM	10	0	10	10	0	10	20	0	20
NICKEL	10	0	6	10	0	6	20	0	15
LEAD	10	0	10	10	0	10	20	12	8
ANTIMONY	10	5	5	10	1	9	20	9	11
SELENIUM	10	0	0	10	0	0	20	0	1
STRONTIUM	10	10	0	10	10	0	20	20	0
TITANIUM	10	2	8	10	2	8	20	3	17
THALLIUM	10	0	0	10	0	0	20	0	0
URANIUM	10	0	10	10	0	10	20	0	20
VANADIUM	10	0	10	10	0	9	20	0	18
ZINC	10	4	6	10	7	3	20	14	6
*TOTAL SCAN METALS	240	57	117	240	43	117	460	139	191
*TOTAL GROUP INORGANIC & PHYSICAL	489	255	149	516	261	133	938	554	227
CHLOROAROMATICS									
HEXACHLOROBUTADIENE	9	0	0	9	0	0	7	0	0
123 TRICHLOROBENZENE	9	0	0	9	0	0	7	0	0
1234 T-CHLOROBENZENE	9	0	0	9	0	0	7	0	0
1235 T-CHLOROBENZENE	9	0	0	9	0	0	7	0	0
124 TRICHLOROBENZENE	9	0	0	9	0	0	7	0	0
1245 T-CHLOROBENZENE	9	0	0	9	0	0	7	0	0
135 TRICHLOROBENZENE	9	0	0	9	0	0	7	0	0
HCB	9	0	0	9	0	0	7	0	0
HEXACHLOROETHANE	9	0	0	9	0	1	7	0	2
OCTACHLOROSTYRENE	9	0	0	9	0	0	7	0	0
PENTACHLOROBENZENE	9	0	0	9	0	0	7	0	0
236 TRICHLOROTOLUENE	9	0	0	9	0	0	7	0	0
245 TRICHLOROTOLUENE	9	0	0	9	0	0	7	0	0
26A TRICHLOROTOLUENE	9	0	0	9	0	0	7	0	0
*TOTAL SCAN CHLOROAROMATICS	126	0	0	126	0	1	98	0	2

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM OWEN SOUND (RICHARD H. HEATH WTP)
SUMMARY TABLE OF RESULTS (1990)

SCAN PARAMETER	RAW			TREATED			SITE 1		
	TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE
CHLOROPHENOLS									
234 TRICHLOROPHENOL	2	0	0	2	0	0	.	.	.
2345 T-CHLOROPHENOL	2	0	0	2	0	0	.	.	.
2356 T-CHLOROPHENOL	2	0	0	2	0	0	.	.	.
245-TRICHLOROPHENOL	2	0	0	2	0	0	.	.	.
246-TRICHLOROPHENOL	2	0	0	2	0	0	.	.	.
PENTACHLOROPHENOL	2	0	0	2	0	0	.	.	.
*TOTAL SCAN CHLOROPHENOLS	12	0	0	12	0	0	0	0	0
PAH									
PHENANTHRENE	9	0	0	9	0	0	2	0	1
ANTHRACENE	9	0	0	9	0	0	2	0	0
FLUORANTHENE	9	0	0	9	0	0	2	0	0
PYRENE	9	0	0	9	0	0	2	0	0
BENZO(A)ANTHRACENE	9	0	0	9	0	0	2	0	0
CHRYSENE	9	0	0	9	0	0	2	0	0
DIMETH. BENZ(A)ANTHR	8	0	0	8	0	0	2	0	0
BENZO(E) PYRENE	9	0	0	9	0	0	2	0	0
BENZO(B) FLUORANTHEN	9	0	0	9	0	0	2	0	0
PERYLENE	9	0	0	9	0	0	2	0	0
BENZO(K) FLUORANTHEN	9	0	0	9	0	0	2	0	0
BENZO(A) PYRENE	9	0	0	9	0	0	2	0	0
BENZO(G,H,I) PERYLEN	9	0	0	9	0	0	2	0	0
DIBENZO(A,H) ANTHRAC	9	0	0	9	0	0	2	0	0
INDENO(1,2,3-C,D) PY	9	0	0	9	0	0	2	0	0
BENZO(B) CHRYSENE	9	0	0	9	0	0	2	0	0
CORONENE	9	0	0	9	0	0	2	0	0
*TOTAL SCAN PAH	152	0	0	152	0	0	34	0	1
PESTICIDES & PCB									
ALDRIN	9	0	0	9	0	0	7	0	0
ALPHA BHC	9	0	6	9	0	7	7	0	6
BETA BHC	9	0	0	9	0	0	7	0	0
LINDANE	9	0	0	9	0	0	7	0	0
ALPHA CHLORDANE	9	0	0	9	0	0	7	0	0
GAMMA CHLORDANE	9	0	0	9	0	0	7	0	0
DIELDRIN	9	0	0	9	0	0	7	0	0
METHOXYCHLOR	9	0	0	9	0	0	7	0	0
ENDOSULFAN 1	9	0	0	9	0	0	7	0	0
ENDOSULFAN II	9	0	0	9	0	0	7	0	0
ENDRIN	9	0	0	9	0	0	7	0	0
ENDOSULFAN SULPHATE	9	0	0	9	0	0	7	0	0
HEPTACHLOR EPOXIDE	9	0	0	9	0	0	7	0	0
HEPTACHLOR	9	0	0	9	0	0	7	0	0
MIREX	9	0	0	9	0	0	7	0	0
OXYCHLORDANE	9	0	0	9	0	0	7	0	0
OPDDT	9	0	0	9	0	0	7	0	0
PCB	9	0	0	9	0	0	7	0	0
DDD	9	0	0	9	0	0	7	0	0
PPDDE	9	0	0	9	0	0	7	0	0

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM OWEN SOUND (RICHARD H. HEATH WTP)
SUMMARY TABLE OF RESULTS (1990)

SCAN PARAMETER	RAW			TREATED			SITE 1		
	TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE
PPDDT	9	0	0	9	0	0	7	0	0
AMETRINE	10	0	0	10	0	0	.	.	.
ATRAZINE	10	0	0	10	0	0	.	.	.
ATRATONE	10	0	0	10	0	0	.	.	.
CYANAZINE (BLADEX)	10	0	0	10	0	0	.	.	.
DESETHYLATRAZINE	10	0	0	10	0	0	.	.	.
D-ETHYL SIMAZINE	10	0	0	10	0	0	.	.	.
PROMETONE	10	0	0	10	0	0	.	.	.
PROPAZINE	10	0	0	10	0	0	.	.	.
PROMETRYNE	10	0	0	10	0	0	.	.	.
METRIBUZIN (SENCOR)	10	0	0	10	0	0	.	.	.
SIMAZINE	10	0	0	10	0	0	.	.	.
ALACHLOR (LASSO)	10	0	0	10	0	0	.	.	.
METOLACHLOR	10	0	0	10	0	0	.	.	.
HEXACLCYCLOPENTADIEN	3	0	0	3	0	0	3	1	0
*TOTAL SCAN PESTICIDES & PCB	322	0	6	322	0	7	150	1	6
PHENOLICS									
PHENOLICS	10	1	5	10	0	4	.	.	.
*TOTAL SCAN PHENOLICS	10	1	5	10	0	4	0	0	0
SPECIFIC PESTICIDES									
TOXAPHENE	9	0	0	9	0	0	7	0	0
2,4,5-T	2	0	0	2	0	0	.	.	.
2,4-D	1	0	0	2	0	0	.	.	.
2,4-DB	2	0	0	2	0	0	.	.	.
2,4 D PROPIONIC ACID	2	0	0	2	0	0	.	.	.
DICAMBA	1	0	0	2	0	0	.	.	.
PICHLORAM	0	0	0	0	0	0	.	.	.
SILVEX	2	0	0	2	0	0	.	.	.
DIAZINON	2	0	0	2	0	0	.	.	.
DICHLOROVOS	2	0	0	2	0	0	.	.	.
CHLORPYRIFOS	2	0	0	2	0	0	.	.	.
ETHION	2	0	0	2	0	0	.	.	.
AZINPHOS-METHYL	0	0	0	0	0	0	.	.	.
MALATHION	2	0	0	2	0	0	.	.	.
MEVINPHOS	2	0	0	2	0	0	.	.	.
METHYL PARATHION	2	0	0	2	0	0	.	.	.
METHYLTRITHION	2	0	0	2	0	0	.	.	.
PARATHION	2	0	0	2	0	0	.	.	.
PHORATE	2	0	0	2	0	0	.	.	.
RELDAN	2	0	0	2	0	0	.	.	.
RONNEL	2	0	0	2	0	0	.	.	.
AMINOCARB	0	0	0	0	0	0	.	.	.
BENOMYL	0	0	0	0	0	0	.	.	.
BUX	0	0	0	0	0	0	.	.	.
CARBOFURAN	1	0	0	1	0	0	.	.	.
CICP	1	0	0	1	0	0	.	.	.
DIALLATE	1	0	0	1	0	0	.	.	.

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM OWEN SOUND (RICHARD H. HEATH WTP)
SUMMARY TABLE OF RESULTS (1990)

SCAN PARAMETER	RAW			TREATED			SITE 1		
	TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE
EPTAM	1	0	0	1	0	0	.	.	.
IPC	1	0	0	1	0	0	.	.	.
PROPOXUR	1	0	0	1	0	0	.	.	.
CARBARYL	1	0	0	1	0	0	.	.	.
BUTYLATE	1	0	0	1	0	0	.	.	.
*TOTAL SCAN SPECIFIC PESTICIDES	51	0	0	53	0	0	7	0	0
VOLATILES									
BENZENE	10	0	1	10	0	4	10	0	2
TOLUENE	10	0	0	10	0	3	10	1	3
ETHYLBENZENE	10	0	3	10	0	5	10	0	7
P-XYLENE	10	0	0	10	0	0	10	0	0
M-XYLENE	10	0	0	10	0	2	10	0	2
O-XYLENE	10	0	0	10	0	3	10	0	2
STYRENE	10	0	3	10	0	0	10	0	1
1,1 DICHLOROETHYLENE	10	0	0	10	0	0	10	0	0
METHYLENE CHLORIDE	10	0	0	10	0	0	10	0	0
T1,2DICHLOROETHYLENE	10	0	1	10	0	0	10	0	0
1,1 DICHLOROETHANE	10	0	0	10	0	0	10	0	0
CHLOROFORM	10	0	0	10	10	0	10	10	0
111, TRICHLOROETHANE	10	0	1	10	0	0	10	0	0
1,2 DICHLOROETHANE	10	0	0	10	0	0	10	0	0
CARBON TETRACHLORIDE	10	0	0	10	0	1	10	0	0
1,2 DICHLOROPROPANE	10	0	0	10	0	0	10	0	0
TRICHLOROETHYLENE	10	0	0	10	0	0	10	0	0
DICHLOROBROMOMETHANE	10	0	0	10	10	0	10	10	0
112 TRICHLOROETHANE	10	0	0	10	0	0	10	0	0
CHLORODIBROMOMETHANE	10	0	0	10	10	0	10	9	1
T-CHLOROETHYLENE	10	0	1	10	0	1	10	0	0
BROMOFORM	10	0	0	10	0	0	10	0	0
1122 T-CHLOROETHANE	10	0	0	10	0	0	10	0	0
CHLOROBENZENE	10	0	0	10	0	0	10	0	0
1,4 DICHLOROBENZENE	10	0	0	10	0	0	10	0	0
1,3 DICHLOROBENZENE	10	0	0	10	0	0	10	0	0
1,2 DICHLOROBENZENE	10	0	0	10	0	0	10	0	0
ETHLYENE DIBROMIDE	10	0	0	10	0	0	10	0	0
TOTL TRIHALOMETHANES	10	0	0	10	10	0	10	10	0
*TOTAL SCAN VOLATILES	290	0	10	290	40	19	290	40	18
*TOTAL GROUP ORGANIC	963	1	21	965	40	31	579	41	27

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM OWEN SOUND SPRING SUPPLY
SUMMARY TABLE OF RESULTS (1990)

SCAN PARAMETER	RAW TOTAL	RAW POSITIVE	RAW TRACE	SITE 1 TOTAL	SITE 1 POSITIVE	SITE 1 TRACE
BACTERIOLOGICAL						
FECAL COLIFORM MF	11	2	0	.	.	.
STANDRD PLATE CNT MF	.	.	.	11	6	0
TOTAL COLIFORM MF	11	6	0	.	.	.
T COLIFORM BCKGRD MF	11	8	0	.	.	.
*TOTAL SCAN BACTERIOLOGICAL	33	16	0	11	6	0
CHEMISTRY (FLD)						
FLD CHLORINE (COMB)	.	.	.	7	0	0
FLD CHLORINE FREE	.	.	.	10	8	0
FLD CHLORINE (TOTAL)	.	.	.	10	8	0
FLD PH	11	11	0	11	11	0
FLD TEMPERATURE	11	11	0	11	11	0
FLD TURBIDITY	7	7	0	10	9	0
*TOTAL SCAN CHEMISTRY (FLD)	29	29	0	59	47	0
CHEMISTRY (LAB)						
ALKALINITY	11	11	0	18	18	0
CALCIUM	11	11	0	18	18	0
CYANIDE	11	0	0	.	.	.
CHLORIDE	11	11	0	18	18	0
COLOUR	11	7	4	18	6	10
CONDUCTIVITY	11	11	0	18	18	0
DISS ORG CARBON	11	11	0	18	18	0
FLUORIDE	11	5	6	17	17	0
HARDNESS	11	11	0	18	18	0
IONCAL	11	11	0	18	18	0
LANGELIERS INDEX	11	11	0	18	18	0
MAGNESIUM	11	11	0	18	18	0
SODIUM	11	11	0	18	18	0
AMMONIUM TOTAL	11	1	3	18	1	7
NITRITE	11	2	6	18	4	10
TOTAL NITRATES	11	11	0	18	18	0
NITROGEN TOT KJELD	11	11	0	18	17	1
PH	11	11	0	18	18	0
PHOSPHORUS FIL REACT	11	2	5	.	.	.
PHOSPHORUS TOTAL	11	1	7	.	.	.
SULPHATE	11	11	0	18	18	0
TURBIDITY	11	7	4	18	14	4
*TOTAL SCAN CHEMISTRY (LAB)	242	179	35	341	293	32

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM OWEN SOUND SPRING SUPPLY
SUMMARY TABLE OF RESULTS (1990)

SCAN PARAMETER	RAW TOTAL	RAW POSITIVE	RAW TRACE	SITE 1 TOTAL	SITE 1 POSITIVE	SITE 1 TRACE
METALS						
SILVER	11	0	0	18	0	0
ALUMINUM	11	11	0	18	18	0
ARSENIC	11	0	6	18	0	18
BARIUM	11	11	0	18	18	0
BORON	11	5	6	18	11	7
BERYLLIUM	11	0	4	18	0	5
CADMIUM	11	0	1	18	0	0
COBALT	11	0	4	18	0	9
CHROMIUM	11	2	6	18	5	8
COPPER	11	11	0	18	18	0
IRON	11	0	1	18	0	12
MERCURY	11	0	1	.	.	.
MANGANESE	11	10	1	18	8	10
MOLYBDENUM	11	0	11	18	0	18
NICKEL	11	1	1	18	2	3
LEAD	11	0	11	18	11	7
ANTIMONY	11	0	10	18	0	18
SELENIUM	11	0	1	18	0	3
STRONTIUM	11	11	0	18	18	0
TITANIUM	11	11	0	18	18	0
THALLIUM	11	0	0	18	0	0
URANIUM	11	4	7	18	16	2
VANADIUM	11	0	5	18	0	8
ZINC	11	4	7	18	14	4
*TOTAL SCAN METALS	264	81	83	414	157	132
*TOTAL GROUP INORGANIC & PHYSICAL	535	289	118	814	497	164
CHLOROAROMATICS						
HEXACHLOROBUTADIENE	9	0	0	8	0	0
123 TRICHLOROBENZENE	9	0	0	8	0	0
1234 T-CHLOROBENZENE	9	0	0	8	0	0
1235 T-CHLOROBENZENE	9	0	0	8	0	0
124 TRICHLOROBENZENE	9	0	0	8	0	0
1245 T-CHLOROBENZENE	9	0	0	8	0	0
135 TRICHLOROBENZENE	9	0	0	8	0	0
HCB	9	0	0	8	0	0
HEXACHLOROETHANE	9	0	0	8	0	1
OCTACHLOROSTYRENE	9	0	0	8	0	0
PENTACHLOROBENZENE	9	0	0	8	0	0
236 TRICHLOROTOLUENE	9	0	0	8	0	0
245 TRICHLOROTOLUENE	9	0	0	8	0	0
26A TRICHLOROTOLUENE	9	0	0	8	0	0
*TOTAL SCAN CHLOROAROMATICS	126	0	0	112	0	1

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM OWEN SOUND SPRING SUPPLY
SUMMARY TABLE OF RESULTS (1990)

SCAN PARAMETER	RAW TOTAL	RAW POSITIVE	RAW TRACE	SITE 1 TOTAL	SITE 1 POSITIVE	SITE 1 TRACE
CHLOROPHENOLS						
234 TRICHLOROPHENOL	2	0	0	.	.	.
2345 T-CHLOROPHENOL	2	0	0	.	.	.
2356 T-CHLOROPHENOL	2	0	0	.	.	.
245-TRICHLOROPHENOL	2	0	0	.	.	.
246-TRICHLOROPHENOL	2	0	0	.	.	.
PENTACHLOROPHENOL	2	0	0	.	.	.
*TOTAL SCAN CHLOROPHENOLS	12	0	0	0	0	0
PAH						
PHENANTHRENE	10	0	0	3	0	3
ANTHRACENE	10	0	0	3	0	0
FLUORANTHENE	10	0	0	3	0	0
PYRENE	10	0	0	3	0	0
BENZO(A)ANTHRACENE	10	0	0	3	0	0
CHRYSENE	10	0	0	3	0	0
DIMETH. BENZ(A)ANTHR	8	0	0	2	0	0
BENZO(E) PYRENE	10	0	0	3	0	0
BENZO(B) FLUORANTHEN	10	0	0	3	0	0
PERYLENE	10	0	0	3	0	0
BENZO(K) FLUORANTHEN	10	0	0	3	0	0
BENZO(A) PYRENE	10	0	0	3	0	0
BENZO(G,H,I) PERYLEN	10	0	0	3	0	0
DIBENZO(A,H) ANTHRAC	10	0	0	3	0	0
INDENO(1,2,3-C,D) PY	10	0	0	3	0	0
BENZO(B) CHRYSENE	10	0	0	3	0	0
CORONENE	10	0	0	3	0	0
*TOTAL SCAN PAH	168	0	0	50	0	3
PESTICIDES & PCB						
ALDRIN	9	0	0	8	0	0
ALPHA BHC	9	0	0	8	0	0
BETA BHC	9	0	0	8	0	0
LINDANE	9	0	0	8	0	0
ALPHA CHLORDANE	9	0	0	8	0	0
GAMMA CHLORDANE	9	0	0	8	0	0
DIELDRIN	9	0	0	8	0	0
METHOXYCHLOR	9	0	0	8	0	0
ENDOSULFAN 1	9	0	0	8	0	0
ENDOSULFAN II	9	0	0	8	0	0
ENDRIN	9	0	0	8	0	0
ENDOSULFAN SULPHATE	9	0	0	8	0	0
HEPTACHLOR EPOXIDE	9	0	0	8	0	0
HEPTACHLOR	9	0	0	8	0	0
MIREX	9	0	0	8	0	0
OXYCHLORDANE	9	0	0	8	0	0
OPDDT	9	0	0	8	0	0
PCB	9	0	0	8	0	0
DDD	9	0	0	8	0	0
PPDDE	9	0	0	8	0	0

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM OWEN SOUND SPRING SUPPLY
SUMMARY TABLE OF RESULTS (1990)

SCAN PARAMETER	RAW TOTAL	RAW POSITIVE	RAW TRACE	SITE 1 TOTAL	SITE 1 POSITIVE	SITE 1 TRACE
PPDDT	9	0	0	8	0	0
AMETRINE	11	0	0	.	.	.
ATRAZINE	11	0	0	.	.	.
ATRATONE	11	0	0	.	.	.
CYANAZINE (BLADEX)	11	0	0	.	.	.
DESETHYLATRAZINE	11	0	0	.	.	.
D-ETHYL SIMAZINE	11	0	0	.	.	.
PROMETONE	11	0	0	.	.	.
PROPAZINE	11	0	0	.	.	.
PROMETRYNE	11	0	0	.	.	.
METRIBUZIN (SENCOR)	11	0	0	.	.	.
SIMAZINE	11	0	0	.	.	.
ALACHLOR (LASSO)	11	0	0	.	.	.
METOLACHLOR	11	0	0	.	.	.
HEXACLCYCLOPENTADIEN	3	0	0	2	0	0
*TOTAL SCAN PESTICIDES & PCB	335	0	0	170	0	0
PHENOLICS						
PHENOLICS	11	1	2	.	.	.
*TOTAL SCAN PHENOLICS	11	1	2	0	0	0
SPECIFIC PESTICIDES						
TOXAPHENE	9	0	0	8	0	0
2,4,5-T	2	0	0	.	.	.
2,4-D	2	0	0	.	.	.
2,4-DB	2	0	0	.	.	.
2,4 D PROPIONIC ACID	2	0	0	.	.	.
DICAMBA	2	0	0	.	.	.
PICHLORAM	0	0	0	.	.	.
SILVEX	2	0	0	.	.	.
DIAZINON	2	0	0	.	.	.
DICHLOROVOS	2	0	0	.	.	.
CHLORPYRIFOS	2	0	0	.	.	.
ETHION	2	0	0	.	.	.
AZINPHOS-METHYL	0	0	0	.	.	.
MALATHION	2	0	0	.	.	.
MEVINPHOS	2	0	0	.	.	.
METHYL PARATHION	2	0	0	.	.	.
METHYLTRITHION	2	0	0	.	.	.
PARATHION	2	0	0	.	.	.
PHORATE	2	0	0	.	.	.
RELDAN	2	0	0	.	.	.
RONNEL	2	0	0	.	.	.
AMINOCARB	0	0	0	.	.	.
BENONYL	0	0	0	.	.	.
BUX	0	0	0	.	.	.
CARBOFURAN	1	0	0	.	.	.
CICP	1	0	0	.	.	.
DIALLATE	1	0	0	.	.	.

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM OWEN SOUND SPRING SUPPLY
SUMMARY TABLE OF RESULTS (1990)

SCAN PARAMETER	RAW TOTAL	RAW POSITIVE	RAW TRACE	SITE 1 TOTAL	SITE 1 POSITIVE	SITE 1 TRACE
EPTAM	1	0	0	.	.	.
IPC	1	0	0	.	.	.
PROPOXUR	1	0	0	.	.	.
CARBARYL	1	0	0	.	.	.
BUTYLATE	1	0	0	.	.	.
*TOTAL SCAN SPECIFIC PESTICIDES	53	0	0	8	0	0
VOLATILES						
BENZENE	11	0	0	10	0	0
TOLUENE	11	0	0	10	0	4
ETHYLBENZENE	11	0	6	10	0	6
P-XYLENE	11	0	0	10	0	0
M-XYLENE	11	0	0	10	0	3
O-XYLENE	11	0	0	10	0	3
STYRENE	11	0	10	10	0	6
1,1 DICHLOROETHYLENE	11	0	0	10	0	0
METHYLENE CHLORIDE	11	0	0	10	0	1
T1,2DICHLOROETHYLENE	11	0	0	10	0	0
1,1 DICHLOROETHANE	11	0	9	10	0	10
CHLOROFORM	11	0	0	10	10	0
111, TRICHLOROETHANE	11	0	11	10	0	10
1,2 DICHLOROETHANE	11	0	0	10	0	0
CARBON TETRACHLORIDE	11	0	0	10	0	0
1,2 DICHLOROPROPANE	11	0	0	10	0	0
TRICHLOROETHYLENE	11	0	0	10	0	0
DICHLOROBROMOMETHANE	11	0	0	10	10	0
112 TRICHLOROETHANE	11	0	0	10	0	0
CHLORODIBROMOMETHANE	11	0	0	10	9	1
T-CHLOROETHYLENE	11	0	1	10	0	0
BROMOFORM	11	0	0	10	0	4
1122 T-CHLOROETHANE	11	0	0	10	0	0
CHLOROBENZENE	11	0	0	10	0	0
1,4 DICHLOROBENZENE	11	0	0	10	0	0
1,3 DICHLOROBENZENE	11	0	0	10	0	0
1,2 DICHLOROBENZENE	11	0	0	10	0	0
ETHLYENE DIBROMIDE	11	0	0	10	0	0
TOTL TRIHALOMETHANES	11	0	0	10	10	0
*TOTAL SCAN VOLATILES	319	0	37	290	39	48
*TOTAL GROUP ORGANIC	1024	1	39	630	39	52

KEY TO TABLE 5 and 6

A ONTARIO DRINKING WATER OBJECTIVES (ODWO)
1. Maximum Acceptable Concentration (MAC)
1+. MAC for Total Trihalomethanes
2. Interim Maximum Acceptable Concentration (IMAC)
3. Aesthetic Objective (AO)
3*. AO for Total Xylenes
4. Recommended Operational Guideline

B HEALTH & WELFARE CANADA (H&W)
1. Maximum Acceptable Concentration (MAC)
2. Proposed MAC
3. Interim MAC
4. Aesthetic Objective (AO)

C WORLD HEALTH ORGANIZATION (WHO)
1. Guideline Value (GV)
2. Tentative GV
3. Aesthetic GV

D US ENVIRONMENTAL PROTECTION AGENCY (EPA)
1. Maximum Contaminant Level (MCL)
2. Suggested No-Adverse Effect Level (SNAEL)
3. Lifetime Health Advisory
4. EPA Ambient Water Quality Criteria
4T. EPA Ambient Water Quality Criteria for Total PAH

F EUROPEAN ECONOMIC COMMUNITY (EEC)
1. Health Related Guideline Level
2. Aesthetic Guideline Level
3. Maximum Admissable Concentration (MADC)

G CALIFORNIA STATE DEPARTMENT OF HEALTH-GUIDELINE VALUE

I NEW YORK STATE AMBIENT WATER GUIDELINE

N/A NONE AVAILABLE

LABORATORY RESULTS, REMARK DESCRIPTIONS

.	No Sample Taken
BDL	Below Minimum Measurement Amount
<T	Greater Than Detection Limit But Not Confident (SEE INTERPRETATION OF RESULTS ABOVE)
>	Results Are Greater Than The Upper Limit
<=>	Approximate Result
!CS	No Data: Contamination Suspected
!IL	No Data: Sample Incorrectly Labelled
!IS	No Data: Insufficient Sample
!IV	No Data: Inverted Septum
!LA	No Data: Laboratory Accident
!LD	No Data: Test Queued After Sample Discarded
!NA	No Data: No Authorization To Perform Reanalysis
!NP	No Data: No Procedure
!NR	No Data: Sample Not Received
!OP	No Data: Obscured Plate
!QU	No Data: Quality Control Unacceptable
!PE	No Data: Procedural Error - Sample Discarded
!PH	No Data: Sample pH Outside Valid Range
!RE	No Data: Received Empty
!RO	No Data: See Attached Report (no numeric results)
!SM	No Data: Sample Missing
!SS	No Data: Send Separate Sample Properly Preserved
!UI	No Data: Indeterminant Interference
!TX	No Data: Time Expired
A3C	Approximate, Total Count Exceeded 300 Colonies
APL	Additional Peak, Large, Not Priority Pollutant
APS	Additional Peak, Less Than, Not Priority Pollutant
CIC	Possible Contamination, Improper Cap
CRO	Calculated Result Only
PPS	Test Performed On Preserved Sample
RNP	P and M-Xylene Not Separated
RRV	Rerun Verification
RVU	Reported Value Unusual
SPS	Several Peaks, Small, Not Priority Pollutant

UCR		Unreliable: Could Not Confirm By Reanalysis
UCS		Unreliable: Contamination Suspected
UIN		Unreliable: Indeterminate Interference
XP		Positive After X Number Of Hours
T#	(T06)	Result Taken After # Hours

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM OWEN SOUND (RICHARD H. HEATH WTP) 1990

	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM	
	RAW	TREATED	SITE 1	
			STANDING	FREE FLOW
BACTERIOLOGICAL				
FECAL COLIFORM MF (CT/100ML)			**DET'N LIMIT = 0**	**GUIDELINE = 0 (A1)**
FEB	326	.	.	.
MAR	4	.	.	.
APR	BDL	.	.	.
MAY	4	.	.	.
JUN	BDL	.	.	.
JUL	BDL	.	.	.
OCT	6	.	.	.
NOV	12	.	.	.
DEC	6	.	.	.
STANDRD PLATE CNT MF (COUNT/ML)			**DET'N LIMIT = 0**	**GUIDELINE = 500/ML (A3)**
FEB	.	0 <=>	.	1 <=>
MAR	.	113	.	10
APR	.	1 <=>	.	0 <=>
MAY	.	0 <=>	.	1 <=>
JUN	.	0 <=>	.	0 <=>
JUL	.	2 <=>	.	0 <=>
OCT	.	0 <=>	.	2 <=>
NOV	.	1 <=>	.	8 <=>
DEC	.	0 <=>	.	0 <=>
TOTAL COLIFORM MF (CT/100ML)			**DET'N LIMIT = 0**	**GUIDELINE = 5/100ML(A1)**
FEB	4600	.	.	.
MAR	320	.	.	.
APR	30 <=>	.	.	.
MAY	1440	.	.	.
JUN	BDL	.	.	.
JUL	90 <=>	.	.	.
OCT	104	.	.	.
NOV	96	.	.	.
DEC	40	.	.	.
T COLIFORM BCKGRD MF (CT/100ML)			**DET'N LIMIT = 0**	**GUIDELINE = N/A**
FEB	18000	.	.	.
MAR	800	.	.	.
APR	18000	.	.	.
MAY	4700	.	.	.
JUN	80 <=>	.	.	.
JUL	2300	.	.	.
OCT	2360	.	.	.
NOV	1640	.	.	.
DEC	350	.	.	.

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM OWEN SOUND (RICHARD H. NEATH WTP) 1990

	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM	
	RAW	TREATED	SITE 1	
			STANDING	FREE FLOW
CHEMISTRY (FLD)				
FLD CHLORINE (COMB) (MG/L)			DET'N LIMIT = 0	GUIDELINE = N/A
FEB	.	.250	.	.200
MAR	.	.250	.	.200
APR	.	.200	.200	.200
MAY	.	.150	.100	.200
JUN	.	.150	.000	.200
OCT	.	.150	.100	.200
NOV	.	.200	.400	.400
DEC	.	.100	.200	.000
FLD CHLORINE FREE (MG/L)			DET'N LIMIT = 0	GUIDELINE = N/A
FEB	.	.700	.	.500
MAR	.	.750	.	.300
APR	.	.600	.100	.700
MAY	.	.800	.200	.300
JUN	.	.800	.500	.500
JUL	.	.800	.100	.500
OCT	.	.850	.300	.300
NOV	.	1.000	.100	.100
DEC	.	1.000	.300	.500
FLD CHLORINE (TOTAL) (MG/L)			DET'N LIMIT = 0	GUIDELINE = N/A
FEB	.	.950	.	.700
MAR	.	1.000	.	.500
APR	.	.800	.300	.900
MAY	.	.950	.300	.500
JUN	.	.950	.500	.700
JUL	.	.900	.100	.500
OCT	.	1.000	.400	.500
NOV	.	1.200	.500	.500
DEC	.	1.100	.500	.500
FLD PH (DMNSLESS)			DET'N LIMIT = N/A	GUIDELINE = 6.5-8.5(A4)
FEB	7.700	7.400	7.500	7.400
MAR	7.700	7.500	7.400	7.400
APR	8.000	7.600	7.400	7.400
MAY	7.900	7.500	7.600	7.400
JUN	7.700	7.700	7.600	7.400
JUL	7.700	7.500	7.500	7.400
OCT	7.700	7.500	7.400	7.400
NOV	7.700	7.500	7.600	7.400
DEC	8.000	7.700	7.600	6.800
FLD TEMPERATURE (DEG.C)			DET'N LIMIT = N/A	GUIDELINE = 15 (A3)
FEB	4.000	1.000	.	2.500
MAR	1.000	2.000	.	3.000
APR	4.000	4.000	17.000	6.000
MAY	6.000	6.000	14.000	8.000
JUN	5.500	6.000	15.000	13.000
JUL	15.500	14.000	20.000	16.500
OCT	11.500	12.000	18.000	12.000
NOV	7.500	8.000	18.000	8.000
DEC	6.000	8.000	14.000	5.000

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM OWEN SOUND (RICHARD H. HEATH WTP) 1990

	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM	
	RAW	TREATED	SITE 1	
			STANDING	FREE FLOW
FLD TURBIDITY (FTU)			DET'N LIMIT = N/A	GUIDELINE = 1 (A1)
FEB	1.600	.160	.300	.650
MAR	1.600	.110	.	.
APR	.630	.400	.	.
MAY	1.100	.120	.190	.190
JUN	.760	.110	.	.
JUL	.	.160	.280	.260
OCT	1.100	.230	.210	.240
NOV	.820	.140	.930	1.200
DEC	.600	.130	.120	.220

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM OWEN SOUND (RICHARD H. NEATH WTP) 1990

	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM	
	RAW	TREATED	SITE 1	
			STANDING	FREE FLOW
CHEMISTRY (LAB)				
ALKALINITY (MG/L)			DET'N LIMIT = 0.2	GUIDELINE = 30-500 (A4)
FEB	91.000	84.500	81.100	82.900
MAR	92.600	77.900	76.700	76.600
APR	78.400	73.700	80.200	74.500
MAY	80.100	77.000	75.600	76.600
JUN	80.400	74.300	75.400	75.100
JUL	80.800	74.600	76.600	75.100
OCT	80.300	75.000	77.400	82.500
NOV	83.200	79.500	108.200	102.100
DEC	80.500	79.400	82.500	78.700
CALCIUM (MG/L)			DET'N LIMIT = 0.2	GUIDELINE = 100 (F2)
FEB	28.800	28.400	27.200	27.800
MAR	32.400	29.200	29.800	29.600
APR	28.000	27.600	29.200	28.200
MAY	27.200	28.400	28.600	27.800
JUN	26.800	27.200	27.500	27.400
JUL	28.800	28.000	29.200	27.800
OCT	29.200	28.100	29.600	30.600
NOV	30.700	30.700	38.600	37.200
DEC	26.600	28.000	29.200	27.400
CHLORIDE (MG/L)			DET'N LIMIT = 0.2	GUIDELINE = 250 (A3)
FEB	8.800	10.400	9.800	10.100
MAR	16.900	7.600	8.200	8.200
APR	5.500	7.400	9.000	7.900
MAY	5.800	8.000	7.900	7.800
JUN	4.400	7.200	6.800	6.700
JUL	5.300	7.000	7.600	6.900
OCT	6.100	7.300	8.200	8.200
NOV	5.200	7.200	10.500	.300 <T
DEC	5.000	9.400	10.500	8.100
COLOUR (HZU)			DET'N LIMIT = 0.5	GUIDELINE = 5 (A3)
FEB	3.500	1.000 <T	1.000 <T	1.000 <T
MAR	4.500	BDL	.500 <T	.500 <T
APR	1.500 <T	.500 <T	1.000 <T	.500 <T
MAY	2.000 <T	.500 <T	.500 <T	.500 <T
JUN	1.500 <T	1.000 <T	.500 <T	1.000 <T
JUL	1.000 <T	BDL	BDL	BDL
OCT	3.000	1.000 <T	1.000 <T	1.500 <T
NOV	2.500	.500 <T	5.000	4.000
DEC	1.000 <T	BDL	.500 <T	.500 <T
CONDUCTIVITY (UMHO/CM)			DET'N LIMIT = 1.	GUIDELINE = 400 (F2)
FEB	239	238	229	233
MAR	234	215	214	212
APR	203	206	221	210
MAY	207	214	212	213
JUN	205	208	210	208
JUL	203	207	213	208
OCT	217	213	220	230
NOV	213	219	280	268
DEC	206	223	232	218

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM OWEN SOUND (RICHARD H. HEATH WTP) 1990

	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM	
	RAW	TREATED	SITE 1	
			STANDING	FREE FLOW
DISS ORG CARBON (MG/L)			DET'N LIMIT = .100	GUIDELINE = 5.0 (A3)
FEB	1.500	1.200	1.100	1.100
MAR	2.000	1.400	1.300	1.300
APR	1.500	1.400	1.600	1.200
MAY	1.500	1.300	1.400	1.300
JUN	1.300	1.100	1.200	1.100
JUL	1.200	1.200	1.300	1.200
OCT	1.700	1.400	1.700	1.700
NOV	1.700	1.600	2.900	1.800
DEC	1.500	1.400	1.600	1.400
FLUORIDE (MG/L)			DET'N LIMIT = 0.01	GUIDELINE = 2.4 (A1)
FEB	.060	1.100	1.080	.980
MAR	.060	.960	.960	.940
APR	.060	1.060	1.160	1.100
MAY	.060	.940	.960	.940
JUN	.080	.900	.860	.880
JUL	.100	.880	.940	.920
OCT	.080	.900	1.000	.980
NOV	.080	1.020	1.080	.940
DEC	.080	.980	.940	.860
HARDNESS (MG/L)			DET'N LIMIT = 0.5	GUIDELINE = 80-100 (A4)
FEB	106.000	104.000	99.000	102.000
MAR	116.000	104.000	104.000	103.000
APR	99.000	98.000	104.000	100.000
MAY	99.000	101.000	101.000	100.000
JUN	94.800	96.100	97.000	97.100
JUL	102.000	99.000	103.000	99.000
OCT	103.500	99.700	104.000	108.700
NOV	107.800	108.400	139.600	133.600
DEC	96.000	102.000	106.000	99.000
IONCAL (DMNSLESS)			DET'N LIMIT = N/A	GUIDELINE = N/A
FEB	4.675	1.960	3.747	2.341
MAR	7.243	6.162	6.559	6.151
APR	2.770	4.478	2.487	5.463
MAY	1.314	3.301	5.292	2.833
JUN	1.482	1.991	2.705	3.508
JUL	5.044	6.013	7.289	5.311
OCT	5.530	5.001	5.817	5.322
NOV	6.914	9.053	7.583	21.910
DEC	1.347	.569	.418	.809
LANGELIERS INDEX (DMNSLESS)			DET'N LIMIT = N/A	GUIDELINE = N/A
FEB	.303	.185	.202	.180
MAR	.304	.001	.034	-.019
APR	.060	.046	.111	.058
MAY	.115	.064	.100	.063
JUN	.231	.142	.163	.190
JUL	.246	.047	.095	.087
OCT	.043	-.091	-.018	.010
NOV	.152	-.020	.330	.243
DEC	.058	-.122	-.031	-.053

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM OWEN SOUND (RICHARD H. NEATH WTP) 1990

	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM	
	RAW	TREATED	SITE 1	
			STANDING	FREE FLOW
MAGNESIUM (MG/L)			DET'N LIMIT = 0.1	GUIDELINE = 30 (F2)
FEB	8.200	8.000	7.600	8.000
MAR	8.500	7.400	7.100	7.000
APR	7.100	7.100	7.500	7.200
MAY	7.500	7.300	7.200	7.400
JUN	6.800	6.850	6.850	7.000
JUL	7.300	7.200	7.400	7.300
OCT	7.450	7.200	7.300	7.850
NOV	7.600	7.750	10.500	9.900
DEC	7.100	7.700	7.900	7.400
SODIUM (MG/L)			DET'N LIMIT = 0.2	GUIDELINE = 200 (A4)
FEB	5.200	5.400	4.800	5.000
MAR	4.400	4.200	3.800	3.800
APR	3.200	3.600	4.200	3.800
MAY	3.600	3.800	4.000	3.770
JUN	3.200	3.500	3.700	3.700
JUL	3.600	3.600	3.800	3.400
OCT	4.000	3.800	4.100	4.300
NOV	3.200	3.800	5.300	5.000
DEC	3.400	4.200	4.400	3.400
AMMONIUM TOTAL (MG/L)			DET'N LIMIT = 0.002	GUIDELINE = 0.05 (F2)
FEB	.018	BDL	BDL	BDL
MAR	BDL	BDL	BDL	BDL
APR	BDL	BDL	BDL	BDL
MAY	.004 <T	BDL	BDL	BDL
JUN	BDL	BDL	BDL	BDL
JUL	BDL	BDL	.002 <T	.002 <T
OCT	.044	.002 <T	.002 <T	BDL
NOV	.008 <T	.014	.024	.008 <T
DEC	.008 <T	BDL	BDL	BDL
NITRITE (MG/L)			DET'N LIMIT = 0.001	GUIDELINE = 1 (A1)
FEB	.002 <T	BDL	BDL	BDL
MAR	.007	.001 <T	.001 <T	.001 <T
APR	.001 <T	BDL	.001 <T	BDL
MAY	.004 <T	.002 <T	.003 <T	.002 <T
JUN	.002 <T	.008	.015	.018
JUL	.004 <T	.001 <T	.002 <T	.001 <T
OCT	.003 <T	BDL	BDL	BDL
NOV	.013	.009	.014	.002 <T
DEC	.004 <T	BDL	BDL	BDL
TOTAL NITRATES (MG/L)			DET'N LIMIT = 0.005	GUIDELINE = 10 (A1)
FEB	.390	.380	.355	.370
MAR	.330	.295	.315	.305
APR	.280	.305	.320	.305
MAY	.310	.310	.310	.310
JUN	.295	.290	.285	.290
JUL	.285	.275	.290	.280
OCT	.280	.280	.290	.295
NOV	.315	.315	.405	.005 <T
DEC	.300	.310	.320	.300

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM OWEN SOUND (RICHARD H. HEATH WTP) 1990

	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM	
	RAW	TREATED	SITE 1	
			STANDING	FREE FLOW
NITROGEN TOT KJELD (MG/L)			DET'N LIMIT = 0.02	GUIDELINE = N/A
FEB	.200	.130	.130	.130
MAR	.250	.110	.130	.150
APR	.150	.080 <T	.120	.090 <T
MAY	.160	.100	.110	.100
JUN	.170	.110	.130	.110
JUL	.150	.110	.140	.120
OCT	.240	.140	.170	.160
NOV	.170	.130	.220	ISM
DEC	.130	.110	.140	.110
PH (DIMNSLESS)			DET'N LIMIT = N/A	GUIDELINE = 6.5-8.5(A4)
FEB	8.300	8.220	8.270	8.230
MAR	8.240	8.050	8.080	8.030
APR	8.120	8.140	8.150	8.140
MAY	8.180	8.130	8.170	8.140
JUN	8.300	8.240	8.250	8.280
JUL	8.280	8.130	8.150	8.170
OCT	8.080	7.990	8.030	8.020
NOV	8.150	8.000	8.140	8.090
DEC	8.130	7.940	8.000	8.020
PHOSPHORUS FIL REACT (MG/L)			DET'N LIMIT = 0.0005	GUIDELINE = N/A
FEB	.000 <T	BDL	.	.
MAR	.000 <T	BDL	.	.
APR	BDL	BDL	.	.
MAY	.000 <T	.000 <T	.	.
JUN	.000 <T	BDL	.	.
JUL	.000 <T	BDL	.	.
OCT	.001 <T	.000 <T	.	.
NOV	BDL	BDL	.	.
DEC	BDL	BDL	.	.
PHOSPHORUS TOTAL (MG/L)			DET'N LIMIT = 0.002	GUIDELINE = .40 (F2)
FEB	.009 <T	.002 <T	.	.
MAR	.018	BDL	.	.
APR	.004 <T	BDL	.	.
MAY	.005 <T	BDL	.	.
JUN	BDL	BDL	.	.
JUL	.003 <T	BDL	.	.
OCT	.019	.018	.	.
NOV	.004 <T	BDL	.	.
DEC	.006 <T	.003 <T	.	.
SULPHATE (MG/L)			DET'N LIMIT = .200	GUIDELINE = 500 (A3)
FEB	16.920	16.570	16.780	16.640
MAR	16.180	15.610	14.950	14.650
APR	15.390	15.500	15.440	15.280
MAY	15.170	15.640	15.670	15.680
JUN	15.010	15.490	15.420	15.400
JUL	14.540	15.150	15.020	14.960
OCT	15.930	15.930	15.970	16.270
NOV	15.150	15.700	15.410	15.350
DEC	15.150	15.670	15.390	15.260

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM OWEN SOUND (RICHARD H. HEATH WTP) 1990

	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM		
	RAW	TREATED	SITE 1		
			STANDING	FREE FLOW	
TURBIDITY (FTU)			DET'N LIMIT = 0.05	GUIDELINE = 1	(A1)
FEB	3.200	.620	.510	.360	
MAR	6.500	.290	.410	.550	
APR	.620	.290	1.160	.350	
MAY	1.600	.300	.610	.630	
JUN	1.400	.140	.400	.140	
JUL	.610	.320	.550	.240	<T
OCT	.720	.190 <T	.310	.230	<T
NOV	1.200	.280	1.000	1.200	
DEC	.870	.370	.300	.380	

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM OWEN SOUND (RICHARD H. HEATH WTP) 1990

	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM	
	RAW	TREATED	SITE 1	
			STANDING	FREE FLOW
METALS				
SILVER (UG/L)			DET'N LIMIT = 0.05	GUIDELINE = 50 (A1)
FEB	BDL	BDL	BDL	BDL
MAR	BDL	BDL	BDL	BDL
APR	BDL	.060 <T	BDL	.060 <T
MAY	BDL	BDL	BDL	BDL
JUN	BDL	BDL	BDL	BDL
JUL	BDL	BDL	BDL	BDL
OCT	BDL	BDL	BDL	BDL
NOV	BDL	BDL	BDL	BDL
DEC	BDL	BDL	BDL	BDL
ALUMINUM (UG/L)			DET'N LIMIT = 0.10	GUIDELINE = 100 (A4)
FEB	25.000	69.000	61.000	66.000
MAR	49.000	62.000	69.000	75.000
APR	8.700	62.000	160.000	68.000
MAY	31.000	81.000	71.000	72.000
JUN	7.800	61.000	71.000	64.000
JUL	8.100	140.000	100.000	120.000
OCT	9.400	110.000	91.000	120.000
NOV	11.000	81.000	200.000	260.000
DEC	9.100	75.000	64.000	68.000
ARSENIC (UG/L)			DET'N LIMIT = 0.10	GUIDELINE = 25 (A1)
FEB	.410 <T	.190 <T	.290 <T	.230 <T
MAR	.320 <T	.220 <T	.220 <T	.140 <T
APR	.310 <T	BDL	BDL	BDL
MAY	.570 <T	.210 <T	.160 <T	.160 <T
JUN	.240 <T	BDL	BDL	BDL
JUL	.450 <T	.270 <T	.230 <T	.250 <T
OCT	.430 <T	.380 <T	.280 <T	.400 <T
NOV	.300 <T	BDL	BDL	BDL
DEC	.550 <T	BDL	BDL	.140 <T
BARIUM (UG/L)			DET'N LIMIT = 0.05	GUIDELINE = 1000 (A2)
FEB	14.000	13.000	15.000	14.000
MAR	13.000	13.000	14.000	13.000
APR	13.000	13.000	13.000	12.000
MAY	14.000	14.000	14.000	14.000
JUN	14.000	14.000	14.000	14.000
JUL	14.000	13.000	14.000	13.000
OCT	14.000	13.000	14.000	14.000
NOV	13.000	13.000	15.000	13.000
DEC	14.000	14.000	14.000	13.000
BORON (UG/L)			DET'N LIMIT = 2.00	GUIDELINE = 5000 (A1)
FEB	22.000	16.000 <T	20.000 <T	20.000 <T
MAR	13.000 <T	12.000 <T	13.000 <T	12.000 <T
APR	50.000	47.000	45.000	21.000
MAY	66.000	71.000	56.000	35.000
JUN	16.000 <T	13.000 <T	16.000 <T	13.000 <T
JUL	23.000	21.000	22.000	23.000
OCT	16.000 <T	15.000 <T	10.000 <T	11.000 <T
NOV	13.000 <T	13.000 <T	14.000 <T	13.000 <T
DEC	17.000 <T	16.000 <T	17.000 <T	17.000 <T

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM OWEN SOUND (RICHARD H. NEATH WTP) 1990

	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM	
	RAW	TREATED	SITE 1	
			STANDING	FREE FLOW
BERYLLIUM (UG/L)			**DET'N LIMIT = 0.05**	**GUIDELINE = 6800 (D4)**
FEB	BDL	BDL	BDL	BDL
MAR	BDL	BDL	BDL	BDL
APR	BDL	.070 <T	BDL	BDL
MAY	.070 <T	.090 <T	.080 <T	.070 <T
JUN	BDL	BDL	BDL	BDL
JUL	BDL	BDL	BDL	BDL
OCT	BDL	BDL	BDL	BDL
NOV	BDL	BDL	BDL	BDL
DEC	BDL	BDL	BDL	BDL
CADMIUM (UG/L)			**DET'N LIMIT = 0.05**	**GUIDELINE = 5 (A1)**
FEB	BDL	BDL	BDL	BDL
MAR	BDL	BDL	BDL	BDL
APR	BDL	BDL	.080 <T	BDL
MAY	BDL	BDL	BDL	BDL
JUN	BDL	BDL	BDL	BDL
JUL	BDL	BDL	BDL	BDL
OCT	BDL	BDL	BDL	BDL
NOV	BDL	BDL	BDL	BDL
DEC	BDL	BDL	BDL	BDL
COBALT (UG/L)			**DET'N LIMIT = 0.02**	**GUIDELINE = N/A**
FEB	.090 <T	.050 <T	.040 <T	.030 <T
MAR	.160 <T	BDL	BDL	BDL
APR	.200 <T	BDL	BDL	BDL
MAY	.030 <T	.100 <T	.100 <T	.070 <T
JUN	.110 <T	.130 <T	.110 <T	.130 <T
JUL	.250 <T	.030 <T	.030 <T	BDL
OCT	.070 <T	.050 <T	.050 <T	.040 <T
NOV	.070 <T	.090 <T	.070 <T	.080 <T
DEC	.070 <T	.070 <T	.050 <T	.050 <T
CHROMIUM (UG/L)			**DET'N LIMIT = 0.50**	**GUIDELINE = 50 (A1)**
FEB	1.900 <T	.760 <T	1.400 <T	1.400 <T
MAR	BDL	BDL	BDL	BDL
APR	2.200 <T	2.200 <T	1.900 <T	BDL
MAY	2.000 <T	2.100 <T	1.400 <T	.660 <T
JUN	1.500 <T	.610 <T	1.600 <T	.610 <T
JUL	1.400 <T	1.300 <T	1.200 <T	1.300 <T
OCT	1.700 <T	1.700 <T	BDL	.640 <T
NOV	.990 <T	.920 <T	1.200 <T	BDL
DEC	1.600 <T	1.600 <T	1.500 <T	1.600 <T
COPPER (UG/L)			**DET'N LIMIT = 0.50**	**GUIDELINE = 1000 (A3)**
FEB	3.200 <T	1.500 <T	58.000	5.200
MAR	5.200	1.200 <T	50.000	4.200 <T
APR	3.500 <T	1.500 <T	63.000	8.000
MAY	3.400 <T	1.700 <T	49.000	7.000
JUN	3.900 <T	1.300 <T	22.000	7.500
JUL	3.900 <T	1.400 <T	49.000	5.000 <T
OCT	3.900 <T	1.300 <T	30.000	5.900
NOV	2.900 <T	1.100 <T	43.000	4.800 <T
DEC	3.000 <T	.860 <T	30.000	5.400

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM OWEN SOUND (RICHARD H. HEATH WTP) 1990

	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM	
	RAW	TREATED	SITE 1	
			STANDING	FREE FLOW
IRON (UG/L)			DET'N LIMIT = 6.00	GUIDELINE = 300 (A3)
FEB	48.000 <T	BDL	BDL	19.000 <T
MAR	110.000	BDL	BDL	9.300 <T
APR	BDL	BDL	48.000 <T	BDL
MAY	18.000 <T	BDL	BDL	BDL
JUN	10.000 <T	BDL	6.700 <T	BDL
JUL	17.000 <T	BDL	BDL	BDL
OCT	33.000 <T	BDL	14.000 <T	12.000 <T
NOV	16.000 <T	BDL	21.000 <T	37.000 <T
DEC	22.000 <T	BDL	BDL	11.000 <T
MANGANESE (UG/L)			DET'N LIMIT = 0.05	GUIDELINE = 50 (A3)
FEB	3.900	.380 <T	.620	.800
MAR	12.000	.260 <T	.750	1.000
APR	1.600	.200 <T	2.300	.760
MAY	2.900	.130 <T	.630	.680
JUN	1.900	.190 <T	.940	.630
JUL	2.500	.210 <T	1.000	.750
OCT	2.500	.350 <T	.950	1.500
NOV	2.100	.300 <T	2.600	2.400
DEC	2.000	.290 <T	.880	1.300
MOLYBDENUM (UG/L)			DET'N LIMIT = 0.05	GUIDELINE = N/A
FEB	.430 <T	.420 <T	.410 <T	.400 <T
MAR	.300 <T	.450 <T	.340 <T	.400 <T
APR	.400 <T	.300 <T	.290 <T	.400 <T
MAY	.370 <T	.350 <T	.410 <T	.450 <T
JUN	.290 <T	.310 <T	.310 <T	.290 <T
JUL	.340 <T	.370 <T	.410 <T	.470 <T
OCT	.340 <T	.380 <T	.340 <T	.350 <T
NOV	.330 <T	.370 <T	.380 <T	.350 <T
DEC	.380 <T	.370 <T	.420 <T	.420 <T
NICKEL (UG/L)			DET'N LIMIT = 0.20	GUIDELINE = 350 (D3)
FEB	BDL	.440 <T	.260 <T	BDL
MAR	BDL	BDL	1.000 <T	BDL
APR	BDL	BDL	.820 <T	BDL
MAY	.330 <T	.270 <T	1.100 <T	.400 <T
JUN	.390 <T	BDL	.340 <T	BDL
JUL	BDL	BDL	.680 <T	BDL
OCT	.610 <T	.550 <T	1.100 <T	.660 <T
NOV	.460 <T	.390 <T	.820 <T	.250 <T
DEC	.330 <T	.370 <T	.470 <T	.220 <T
LEAD (UG/L)			DET'N LIMIT = 0.05	GUIDELINE = 10. (A1)
FEB	.190 <T	.490 <T	3.100	.340 <T
MAR	.490 <T	.160 <T	2.700	.330 <T
APR	.190 <T	.250 <T	4.600	.600
MAY	.120 <T	.210 <T	2.800	.440 <T
JUN	.330 <T	.320 <T	2.500	.620
JUL	.210 <T	.220 <T	5.100	.460 <T
OCT	.120 <T	.160 <T	1.800	.400 <T
NOV	.090 <T	.140 <T	2.600	.450 <T
DEC	.210 <T	.220 <T	1.600	.390 <T

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM OWEN SOUND (RICHARD H. HEATH WTP) 1990

	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM	
	RAW	TREATED	SITE 1	
			STANDING	FREE FLOW
ANTIMONY (UG/L)			DET'N LIMIT = 0.05	GUIDELINE = 146 (D4)
FEB	.500 <T	.480 <T	.540	.510
MAR	.300 <T	.340 <T	.440 <T	.360 <T
APR	1.200	.420 <T	.610	.430 <T
MAY	.220 <T	.150 <T	.500 <T	.310 <T
JUN	.640	.540	.480 <T	.480 <T
JUL	1.000	.390 <T	.610	.440 <T
OCT	.510	.450 <T	.580	.570
NOV	.390 <T	.450 <T	.460 <T	.490 <T
DEC	.420 <T	.360 <T	.860	.480 <T
SELENIUM (UG/L)			DET'N LIMIT = 1.00	GUIDELINE = 10 (A1)
FEB	BDL	BDL	BDL	BDL
MAR	BDL	BDL	BDL	BDL
APR	BDL	BDL	BDL	1.200 <T
MAY	BDL	BDL	BDL	BDL
JUN	BDL	BDL	BDL	BDL
JUL	BDL	BDL	BDL	BDL
OCT	BDL	BDL	BDL	BDL
NOV	BDL	BDL	BDL	BDL
DEC	BDL	BDL	BDL	BDL
STRONTIUM (UG/L)			DET'N LIMIT = 0.10	GUIDELINE = N/A
FEB	100.000	99.000	100.000	100.000
MAR	93.000	93.000	96.000	94.000
APR	90.000	88.000	91.000	88.000
MAY	99.000	97.000	99.000	96.000
JUN	90.000	92.000	92.000	92.000
JUL	96.000	95.000	95.000	95.000
OCT	92.000	92.000	90.000	93.000
NOV	89.000	89.000	96.000	93.000
DEC	91.000	91.000	94.000	91.000
TITANIUM (UG/L)			DET'N LIMIT = 0.50	GUIDELINE = N/A
FEB	3.100 <T	2.500 <T	2.400 <T	2.600 <T
MAR	4.800 <T	3.700 <T	3.400 <T	3.700 <T
APR	6.500	5.800	7.200	6.500
MAY	5.900	5.400	5.000 <T	5.700
JUN	4.400 <T	4.800 <T	4.900 <T	4.600 <T
JUL	2.700 <T	2.500 <T	2.800 <T	2.900 <T
OCT	1.700 <T	1.700 <T	2.000 <T	2.000 <T
NOV	2.500 <T	2.400 <T	4.300 <T	4.300 <T
DEC	2.400 <T	2.300 <T	2.700 <T	2.400 <T
URANIUM (UG/L)			DET'N LIMIT = 0.05	GUIDELINE = 100 (A1)
FEB	.200 <T	.150 <T	.110 <T	.180 <T
MAR	.230 <T	.080 <T	.090 <T	.090 <T
APR	.210 <T	.070 <T	.150 <T	.090 <T
MAY	.110 <T	.090 <T	.070 <T	.070 <T
JUN	.160 <T	.070 <T	.070 <T	.070 <T
JUL	.160 <T	.070 <T	.090 <T	.100 <T
OCT	.190 <T	.150 <T	.160 <T	.200 <T
NOV	.170 <T	.120 <T	.250 <T	.270 <T
DEC	.170 <T	.110 <T	.110 <T	.120 <T

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM OWEN SOUND (RICHARD H. HEATH WTP) 1990

	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM	
	RAW	TREATED	SITE 1	
			STANDING	FREE FLOW
VANADIUM (UG/L)			DET'N LIMIT = 0.05	GUIDELINE = N/A
FEB	.140 <T	.120 <T	.160 <T	.160 <T
MAR	.280 <T	.090 <T	.140 <T	.130 <T
APR	.150 <T	.090 <T	.150 <T	BDL
MAY	.090 <T	.070 <T	.080 <T	.080 <T
JUN	.160 <T	.150 <T	.120 <T	.130 <T
JUL	.150 <T	.110 <T	.150 <T	.170 <T
OCT	.120 <T	.090 <T	.120 <T	.100 <T
NOV	.090 <T	BDL	.110 <T	.100 <T
DEC	.140 <T	.090 <T	.070 <T	BDL
ZINC (UG/L)			DET'N LIMIT = 0.20	GUIDELINE = 5000 (A3)
FEB	3.100	3.600	32.000	1.700 <T
MAR	2.900	1.400 <T	26.000	1.200 <T
APR	2.100	2.900	23.000	2.500
MAY	.950 <T	2.200	22.000	1.700 <T
JUN	2.500	2.900	7.300	2.300
JUL	1.100 <T	2.100	22.000	1.300 <T
OCT	1.900 <T	2.400	36.000	2.600
NOV	.800 <T	1.400 <T	16.000	2.600
DEC	1.200 <T	1.100 <T	15.000	1.700 <T

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM OWEN SOUND (RICHARD H. NEATH WTP) 1990

	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM		
	RAW	TREATED	SITE 1		
			STANDING	FREE FLOW	
CHLOROAROMATICS					
HEXACHLOROETHANE (NG/L)			**DET'N LIMIT = 1.000**	**GUIDELINE = 1900 (D4)**	
FEB	!QU	!QU	.	!QU	
MAR	BDL	BDL	.	BDL	
APR	BDL	BDL	.	BDL	
MAY	BDL	BDL	.	!LA	
JUN	BDL	BDL	.	BDL	
JUL	BDL	BDL	.	BDL	
OCT	BDL	BDL	.	BDL	
NOV	BDL	BDL	.	2.000 <T	
DEC	BDL	2.000 <T	.	3.000 <T	
HEXACHLOROCYCLOPENTADIENE (NG/L)			**DET'N LIMIT = 5.000**	**GUIDELINE = 206000 (D1)**	
OCT	BDL	BDL	.	60.000	
NOV	BDL	BDL	.	BDL	
DEC	BDL	BDL	.	BDL	

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM OWEN SOUND (RICHARD H. HEATH WTP) 1990

	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM	
	RAW	TREATED	SITE 1	
			STANDING	FREE FLOW
PHENANTHRENE (NG/L PAH)			DET'N LIMIT = 10.	GUIDELINE = 2.8 (D4T)
FEB	IQU	IQU	.	.
MAR	BDL	BDL	.	.
APR	BDL	BDL	.	.
MAY	BDL	BDL	.	.
JUN	BDL	BDL	.	.
JUL	BDL	BDL	.	.
OCT	BDL	BDL	.	BDL
NOV	BDL	BDL	.	30.000 <T
DEC	BDL	BDL	.	.

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM OWEN SOUND (RICHARD H. HEATH WTP) 1990

	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM	
	RAW	TREATED	SITE 1	
			STANDING	FREE FLOW
PESTICIDES & PCB				
ALPHA BHC (NG/L)			DET'N LIMIT = 1.000	GUIDELINE = 700 (G)
FEB	!QU	!QU	.	!QU
MAR	BDL	1.000 <T	.	1.000 <T
APR	1.000 <T	1.000 <T	.	2.000 <T
MAY	1.000 <T	1.000 <T	.	!LA
JUN	BDL	1.000 <T	.	BDL
JUL	BDL	BDL	.	1.000 <T
OCT	1.000 <T	2.000 <T	.	1.000 <T
NOV	1.000 <T	1.000 <T	.	1.000 <T
DEC	1.000 <T	BDL	.	1.000 <T

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM OWEN SOUND (RICHARD H. HEATH WTP) 1990

	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM		
	RAW	TREATED	SITE 1		
			STANDING	FREE FLOW	
PHENOLICS (UG/L	PHENOLICS)		DET'N LIMIT = .2	GUIDELINE = 2	(A4)
FEB	.400 <T	.400 <T	.	.	
MAR	.600 <T	.400 <T	.	.	
APR	BDL	BDL	.	.	
MAY	BDL	BDL	.	.	
JUN	BDL	BDL	.	.	
JUL	BDL	BDL	.	.	
OCT	.600 <T	BDL	.	.	
NOV	1.200	.800 <T	.	.	
DEC	.600 <T	.800 <T	.	.	

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM OWEN SOUND (RICHARD H. HEATH WTP) 1990

	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM	
	RAW	TREATED	SITE 1	
			STANDING	FREE FLOW
VOLATILES				
BENZENE (UG/L)			**DET'N LIMIT = 0.05**	**GUIDELINE = 5 (A1)**
FEB	BDL	BDL	.	BDL
MAR	BDL	.050 <T	.	BDL
APR	.100 <T	.100 <T	.	.200 <T
MAY	BDL	.100 <T	.	.050 <T
JUN	BDL	.050 <T	.	BDL
JUL	BDL	BDL	.	BDL
OCT	BDL	BDL	.	BDL
NOV	BDL	BDL	.	BDL
DEC	BDL	BDL	.	BDL
TOLUENE (UG/L)			**DET'N LIMIT = 0.05**	**GUIDELINE = 24 (A3)**
FEB	BDL	BDL	.	BDL
MAR	BDL	BDL	.	BDL
APR	BDL	.350 <T	.	.550
MAY	BDL	.100 <T	.	.100 <T
JUN	BDL	BDL	.	BDL
JUL	BDL	BDL	.	BDL
OCT	BDL	BDL	.	.050 <T
NOV	BDL	BDL	.	BDL
DEC	BDL	.200 <T	.	.050 <T
ETHYLBENZENE (UG/L)			**DET'N LIMIT = 0.05**	**GUIDELINE = 2.4 (A3)**
FEB	BDL	BDL	.	BDL
MAR	BDL	.050 <T	.	.100 <T
APR	BDL	.100 <T	.	.350 <T
MAY	BDL	.100 <T	.	.050 <T
JUN	.150 <T	.100 <T	.	.150 <T
JUL	BDL	BDL	.	.100 <T
OCT	BDL	BDL	.	.050 <T
NOV	.050 <T	BDL	.	BDL
DEC	.050 <T	.100 <T	.	.100 <T
M-XYLENE (UG/L)			**DET'N LIMIT = 0.10**	**GUIDELINE = 300 (A3*)**
FEB	BDL	BDL	.	BDL
MAR	BDL	BDL	.	BDL
APR	BDL	.400 <T	.	.500 <T
MAY	BDL	.100 <T	.	.100 <T
JUN	BDL	BDL	.	BDL
JUL	BDL	BDL	.	BDL
OCT	BDL	BDL	.	BDL
NOV	BDL	BDL	.	BDL
DEC	BDL	BDL	.	BDL
O-XYLENE (UG/L)			**DET'N LIMIT = 0.05**	**GUIDELINE = 300 (A3*)**
FEB	BDL	BDL	.	BDL
MAR	BDL	BDL	.	BDL
APR	BDL	.150 <T	.	.250 <T
MAY	BDL	.050 <T	.	.050 <T
JUN	BDL	BDL	.	BDL
JUL	BDL	BDL	.	BDL
OCT	BDL	BDL	.	BDL
NOV	BDL	BDL	.	BDL
DEC	BDL	.050 <T	.	BDL

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM OWEN SOUND (RICHARD H. HEATH WTP) 1990

	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM	
	RAW	TREATED	SITE 1	
			STANDING	FREE FLOW
STYRENE (UG/L)			DET'N LIMIT = 0.05	GUIDELINE = 100 (D1)
FEB	BDL	BDL	.	BDL
MAR	BDL	BDL	.	BDL
APR	BDL	BDL	.	BDL
MAY	BDL	BDL	.	BDL
JUN	.250 <T	BDL	.	.050 <T
JUL	BDL	BDL	.	BDL
OCT	BDL	BDL	.	BDL
NOV	.100 <T	BDL	.	BDL
DEC	.100 <T	BDL	.	BDL
T1,2DICHLOROETHYLENE (UG/L)			DET'N LIMIT = 0.10	GUIDELINE = 70 (D1)
FEB	BDL	BDL	.	BDL
MAR	BDL	BDL	.	BDL
APR	.100 <T	BDL	.	BDL
MAY	BDL	BDL	.	BDL
JUN	BDL	BDL	.	BDL
JUL	BDL	BDL	.	BDL
OCT	BDL	BDL	.	BDL
NOV	BDL	BDL	.	BDL
DEC	BDL	BDL	.	BDL
CHLOROFORM (UG/L)			DET'N LIMIT = 0.10	GUIDELINE = 350 (A1+)
FEB	BDL	24.400	.	23.000
MAR	BDL	24.100	.	21.400
APR	BDL	20.300	.	26.100
MAY	BDL	19.100	.	19.600
JUN	BDL	16.800	.	18.700
JUL	BDL	25.000	.	23.400
OCT	BDL	31.800	.	37.800
NOV	BDL	33.400	.	60.300
DEC	BDL	23.500	.	24.900
111, TRICHLOROETHANE (UG/L)			DET'N LIMIT = 0.02	GUIDELINE = 200 (D1)
FEB	BDL	BDL	.	BDL
MAR	BDL	BDL	.	BDL
APR	BDL	BDL	.	BDL
MAY	BDL	BDL	.	BDL
JUN	BDL	BDL	.	BDL
JUL	BDL	BDL	.	BDL
OCT	.040 <T	BDL	.	BDL
NOV	BDL	BDL	.	BDL
DEC	BDL	BDL	.	BDL
CARBON TETRACHLORIDE (UG/L)			DET'N LIMIT = 0.20	GUIDELINE = 5 (A1)
FEB	BDL	BDL	.	BDL
MAR	BDL	BDL	.	BDL
APR	BDL	BDL	.	BDL
MAY	BDL	BDL	.	BDL
JUN	BDL	BDL	.	BDL
JUL	BDL	BDL	.	BDL
OCT	BDL	BDL	.	BDL
NOV	BDL	BDL	.	BDL
DEC	BDL	.200 <T	.	BDL

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM OWEN SOUND (RICHARD H. NEATH WTP) 1990

	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM	
	RAW	TREATED	SITE 1	
			STANDING	FREE FLOW
DICHLOROBROMOMETHANE (UG/L)			DET'N LIMIT = 0.05	GUIDELINE = 350 (A1+)
FEB	BDL	8.000	.	8.200
MAR	BDL	8.800	.	8.450
APR	BDL	8.400	.	9.150
MAY	BDL	7.500	.	7.750
JUN	BDL	8.850	.	8.850
JUL	BDL	8.350	.	8.250
OCT	BDL	9.650	.	8.900
NOV	BDL	9.650	.	7.950
DEC	BDL	9.350	.	8.400
CHLORODIBROMOMETHANE (UG/L)			DET'N LIMIT = 0.10	GUIDELINE = 350 (A1+)
FEB	BDL	1.600	.	1.800
MAR	BDL	1.900	.	2.000
APR	BDL	2.500	.	2.400
MAY	BDL	1.800	.	1.900
JUN	BDL	2.700	.	3.000
JUL	BDL	2.600	.	2.700
OCT	BDL	1.900	.	1.400
NOV	BDL	1.700	.	.600 <T
DEC	BDL	2.200	.	1.900
T-CHLOROETHYLENE (UG/L)			DET'N LIMIT = 0.05	GUIDELINE = 5 (D1)
FEB	BDL	BDL	.	BDL
MAR	BDL	BDL	.	BDL
APR	BDL	BDL	.	BDL
MAY	BDL	BDL	.	BDL
JUN	BDL	BDL	.	BDL
JUL	BDL	BDL	.	BDL
OCT	.100 <T	BDL	.	BDL
NOV	BDL	BDL	.	BDL
DEC	BDL	.050 <T	.	BDL
TOTL TRIHALOMETHANES (UG/L)			DET'N LIMIT = 0.50	GUIDELINE = 350 (A1)
FEB	BDL	33.900	.	33.000
MAR	BDL	34.800	.	31.850
APR	BDL	31.250	.	37.700
MAY	BDL	28.400	.	29.250
JUN	BDL	28.350	.	30.550
JUL	BDL	35.950	.	34.350
OCT	BDL	43.300	.	48.150
NOV	BDL	44.750	.	68.750
DEC	BDL	35.000	.	35.250

TRACE LEVELS OF TOLUENE ARE LABORATORY ARTIFACTS DERIVED FROM THE ANALYTICAL METHODOLOGY.

TRACE LEVELS OF STYRENE ARE CONSIDERED TO BE LABORATORY ARTIFACTS RESULTING FROM THE LABORATORY SHIPPING CONTAINERS.

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM OWEN SOUND SPRING SUPPLY 1990

	WATER TREATMENT PLANT			DISTRIBUTION SYSTEM
	RAW	SITE 1		
		STANDING	FREE FLOW	
BACTERIOLOGICAL				
FECAL COLIFORM MF (CT/100ML)			DET'N LIMIT = 0	GUIDELINE = 0 (A1)
FEB	BDL	.	.	
MAR	BDL	.	.	
APR	0	.	.	
MAY	BDL	.	.	
JUN	BDL	.	.	
JUL	BDL	.	.	
AUG	BDL	.	.	
OCT	BDL	.	.	
NOV	16	.	.	
DEC	BDL	.	.	
STANDRD PLATE CNT MF (COUNT/ML)			DET'N LIMIT = 0	GUIDELINE = 500/ML (A3)
FEB	.	.	0 <=>	
MAR	.	16	.	
APR	.	.	5 <=>	
MAY	.	.	0 <=>	
JUN	.	.	1 <=>	
JUL	.	.	590	
AUG	.	.	2400 >	
OCT	.	.	160	
NOV	.	.	123	
DEC	.	.	1 <=>	
TOTAL COLIFORM MF (CT/100ML)			DET'N LIMIT = 0	GUIDELINE = 5/100ML(A1)
FEB	BDL	.	.	
MAR	BDL	.	.	
APR	22	.	.	
MAY	10 <=>	.	.	
JUN	BDL	.	.	
JUL	56	.	.	
AUG	10 <=>	.	.	
OCT	12	.	.	
NOV	152	.	.	
DEC	4	.	.	
T COLIFORM BCKGRD MF (CT/100ML)			DET'N LIMIT = 0	GUIDELINE = N/A
FEB	30 <=>	.	.	
MAR	48	.	.	
APR	68	.	.	
MAY	50 <=>	.	.	
JUN	170	.	.	
JUL	56	.	.	
AUG	60 <=>	.	.	
OCT	52	.	.	
NOV	2280	.	.	
DEC	56	.	.	

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM OWEN SOUND SPRING SUPPLY 1990

	WATER TREATMENT PLANT			DISTRIBUTION SYSTEM
	RAW	SITE 1		
		STANDING	FREE FLOW	
CHEMISTRY (FLD)				
FLD CHLORINE (COMB) (MG/L)			DET'N LIMIT = N/A	GUIDELINE = N/A
MAY	.	.	.000	
JUN	.	.	.000	
OCT	.	.	.000	
NOV	.	.000	.000	
DEC	.	.	.000	
FLD CHLORINE FREE (MG/L)			DET'N LIMIT = N/A	GUIDELINE = N/A
APR	.	.	.100	
MAY	.	.	.100	
JUN	.	.	.300	
JUL	.	.	.100	
AUG	.	.	.100	
OCT	.	.	.100	
NOV	.	.000	.000	
DEC	.	.	.100	
FLD CHLORINE (TOTAL) (MG/L)			DET'N LIMIT = N/A	GUIDELINE = N/A
APR	.	.	.200	
MAY	.	.	.100	
JUN	.	.	.300	
JUL	.	.	.100	
AUG	.	.	.100	
OCT	.	.	.100	
NOV	.	.000	.000	
DEC	.	.	.100	
FLD PH (DMNSLESS)			DET'N LIMIT = N/A	GUIDELINE = 6.5-8.5(A4)
FEB	7.500	.	.	
MAR	7.300	7.400	.	
APR	7.300	.	7.500	
MAY	7.500	.	7.600	
JUN	7.500	.	7.500	
JUL	7.500	.	7.500	
AUG	7.300	.	7.700	
OCT	7.500	.	7.500	
NOV	7.500	7.700	7.500	
DEC	7.500	.	7.500	
FLD TEMPERATURE (DEG.C)			DET'N LIMIT = N/A	GUIDELINE = 15 (A3)
FEB	7.000	.	.	
MAR	4.500	.		
APR	8.000	.	8.000	
MAY	8.000	.	11.000	
JUN	8.500	.	14.700	
JUL	8.000	.	18.000	
AUG	8.000	.	19.500	
OCT	8.000	.	14.000	
NOV	7.000	16.000	9.000	
DEC	6.500	.	6.000	

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM OWEN SOUND SPRING SUPPLY 1990

WATER TREATMENT PLANT — DISTRIBUTION SYSTEM

RAW — SITE 1

	FLD TURBIDITY (FTU)	STANDING	FREE FLOW	
			DET'N LIMIT = N/A	GUIDELINE = 1 (A1)
APR	.160	.	.200	
MAY	.250	.	.130	
JUN	.230	.	.260	
JUL	.160	.	.210	
AUG	.200	.	.150	
OCT	.170	.	.280	
NOV	.	.	.190	
DEC	.	.000	.230	

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM OWEN SOUND SPRING SUPPLY 1990

	WATER TREATMENT PLANT			DISTRIBUTION SYSTEM
	RAW	SITE 1		
		STANDING	FREE FLOW	
CHEMISTRY (LAB)				
ALKALINITY (MG/L)			DET'N LIMIT = 0.2	GUIDELINE = 30-500 (A4)
FEB	295.700	.	288.500	
MAR	272.700	269.600	.	
APR	301.800	.	273.200	
MAY	288.100	286.800	286.500	
JUN	286.000	300.600	300.300	
JUL	303.000	298.100	298.800	
AUG	301.800	.	300.000	
OCT	304.200	309.800	300.200	
NOV	287.700	273.800	278.500	
DEC	296.300	293.900	294.100	
CALCIUM (MG/L)			DET'N LIMIT = 0.1	GUIDELINE = 100 (F2)
FEB	83.200	.	82.800	
MAR	82.400	80.600	.	
APR	84.000	.	81.400	
MAY	85.600	90.400	89.600	
JUN	77.000	91.900	90.000	
JUL	90.200	91.000	90.200	
AUG	92.100	.	92.600	
OCT	91.700	90.800	92.800	
NOV	87.900	83.600	85.300	
DEC	83.200	84.200	83.400	
CHLORIDE (MG/L)			DET'N LIMIT = 0.2	GUIDELINE = 250 (A3)
FEB	18.800	.	19.900	
MAR	15.800	14.800	.	
APR	15.600	.	16.200	
MAY	16.800	17.500	17.500	
JUN	17.000	17.500	17.600	
JUL	17.500	18.100	18.200	
AUG	19.000	.	19.700	
OCT	19.200	20.000	19.900	
NOV	16.300	17.000	16.600	
DEC	17.100	17.000	17.200	
COLOUR (HZU)			DET'N LIMIT = 0.5	GUIDELINE = 5 (A3)
FEB	3.000	.	2.000 <T	
MAR	4.000	2.500	.	
APR	3.500	.	2.500	
MAY	3.000	2.500	2.500	
JUN	2.000 <T	1.000 <T	2.000 <T	
JUL	1.500 <T	.500 <T	BDL	
AUG	2.000 <T	.	.500 <T	
OCT	4.000	BDL	.500 <T	
NOV	7.500	2.500	5.000	
DEC	4.000	2.000 <T	2.000 <T	

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM OWEN SOUND SPRING SUPPLY 1990

	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM
	RAW	SITE 1	
		STANDING / FREE FLOW	
CONDUCTIVITY (UMHO/CM)		DET'N LIMIT = 1.	GUIDELINE = 400 (F2)
FEB	633	. / 633	
MAR	588	589 / .	
APR	596	. / 592	
MAY	613	608 / 615	
JUN	621	634 / 630	
JUL	645	640 / 642	
AUG	640	. / 639	
OCT	663	655 / 634	
NOV	610	588 / 595	
DEC	624	620 / 624	
DISS ORG CARBON (MG/L)		DET'N LIMIT = .100	GUIDELINE = 5.0 (A3)
FEB	.900	. / .900	
MAR	1.400	1.400 / .	
APR	1.100	. / 1.200	
MAY	1.200	1.200 / 1.200	
JUN	.800	.800 / .800	
JUL	.800	.600 / .600	
AUG	.900	. / .800	
OCT	1.100	1.200 / 1.100	
NOV	2.100	2.000 / 2.200	
DEC	1.500	1.500 / 1.500	
FLUORIDE (MG/L)		DET'N LIMIT = 0.01	GUIDELINE = 2.4 (A1)
FEB	.040 <T	. / .920	
MAR	.040 <T	.980 / .	
APR	.020 <T	. / .960	
MAY	.060	.940 / .960	
JUN	.040 <T	.900 / .900	
JUL	.060	.860 / .860	
AUG	.020 <T	. / .820	
OCT	.040 <T	.860 / ISM	
NOV	.060	.860 / .860	
DEC	.060	.900 / .900	
HARDNESS (MG/L)		DET'N LIMIT = 0.5	GUIDELINE = 80-100 (A4)
FEB	329.000	. / 324.000	
MAR	315.000	309.000 / .	
APR	320.000	. / 311.000	
MAY	328.000	340.000 / 340.000	
JUN	310.300	348.800 / 345.400	
JUL	344.000	347.000 / 343.000	
AUG	350.800	. / 350.000	
OCT	352.100	347.100 / 353.300	
NOV	327.300	312.500 / 318.500	
DEC	321.000	324.000 / 323.000	

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM OWEN SOUND SPRING SUPPLY 1990

	WATER TREATMENT PLANT			DISTRIBUTION SYSTEM
	RAW	SITE 1		
		STANDING	FREE FLOW	
IONCAL (DIMNSLESS)			DET'N LIMIT = N/A	GUIDELINE = N/A
FEB	2.375	.	1.900	
MAR	3.055	3.534	.	
APR	5.231	.	.487	
MAY	1.008	4.694	4.665	
JUN	3.837	2.912	1.984	
JUL	1.416	3.130	1.861	
AUG	3.311	.	3.120	
OCT	3.288	.490	4.678	
NOV	2.422	2.935	2.770	
DEC	3.029	1.756	2.300	
LANGELIERS INDEX (DIMNSLESS)			DET'N LIMIT = N/A	GUIDELINE = N/A
FEB	1.178	.	1.095	
MAR	1.052	.917	.	
APR	1.214	.	1.117	
MAY	1.220	1.312	1.187	
JUN	1.331	1.418	1.469	
JUL	1.103	1.130	1.127	
AUG	1.201	.	1.171	
OCT	1.081	1.135	1.472	
NOV	1.041	.990	1.016	
DEC	.949	.951	.947	
MAGNESIUM (MG/L)			DET'N LIMIT = 0.05	GUIDELINE = 30 (F2)
FEB	29.300	.	28.300	
MAR	26.700	26.000	.	
APR	26.700	.	26.300	
MAY	27.800	27.800	28.300	
JUN	28.650	28.950	29.300	
JUL	28.800	29.000	28.600	
AUG	29.400	.	28.850	
OCT	29.900	29.250	29.550	
NOV	26.200	25.200	25.600	
DEC	27.600	27.600	27.900	
SODIUM (MG/L)			DET'N LIMIT = 0.2	GUIDELINE = 200 (A4)
FEB	9.800	.	10.200	
MAR	8.400	9.600	.	
APR	8.200	.	8.200	
MAY	8.800	9.000	8.800	
JUN	9.400	9.300	9.300	
JUL	9.600	9.400	9.200	
AUG	10.300	.	10.000	
OCT	11.200	11.000	10.800	
NOV	9.800	10.200	9.500	
DEC	8.800	8.400	8.200	

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM OWEN SOUND SPRING SUPPLY 1990

	WATER TREATMENT PLANT			DISTRIBUTION SYSTEM
	RAW	SITE 1		
		STANDING	FREE FLOW	
AMMONIUM TOTAL (MG/L)			DET'N LIMIT = 0.002	GUIDELINE = 0.05 (F2)
FEB	BDL	.	BDL	
MAR	BDL	BDL	.	
APR	BDL	.	BDL	
MAY	BDL	BDL	BDL	
JUN	BDL	BDL	BDL	
JUL	.002 <T	.002 <T	.004 <T	
AUG	.002 <T	.	.008 <T	
OCT	BDL	BDL	BDL	
NOV	.014	.020	.004 <T	
DEC	.004 <T	.006 <T	.002 <T	
NITRITE (MG/L)			DET'N LIMIT = 0.001	GUIDELINE = 1 (A1)
FEB	BDL	.	BDL	
MAR	.002 <T	.001 <T	.	
APR	.002 <T	.	.002 <T	
MAY	.002 <T	.002 <T	.002 <T	
JUN	.021	.023	.023	
JUL	.002 <T	.002 <T	.002 <T	
AUG	.001 <T	.	.002 <T	
OCT	BDL	.001 <T	BDL	
NOV	.018	.021	.012	
DEC	.001 <T	.002 <T	BDL	
TOTAL NITRATES (MG/L)			DET'N LIMIT = 0.02	GUIDELINE = 10 (A1)
FEB	3.190	.	3.180	
MAR	2.680	2.590	.	
APR	2.960	.	2.960	
MAY	3.280	3.210	3.220	
JUN	3.630	3.610	3.620	
JUL	3.340	3.410	3.390	
AUG	3.370	.	3.330	
OCT	2.880	2.760	2.800	
NOV	2.380	2.230	2.220	
DEC	2.720	2.700	2.690	
NITROGEN TOT KJELD (MG/L)			DET'N LIMIT = 0.02	GUIDELINE = N/A
FEB	.160	.	.150	
MAR	.190	.180	.	
APR	.270	.	.160	
MAY	.150	.160	.120	
JUN	.300	.140	.110	
JUL	.160	.150	.130	
AUG	.120	.	.100	
OCT	.150	.170	.160	
NOV	.260	.300	.290	
DEC	.150	.150	.160	

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM OWEN SOUND SPRING SUPPLY 1990

	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM
	RAW	SITE 1	
		STANDING / FREE FLOW	
PH (DIMNSLESS)		DET'N LIMIT = N/A	GUIDELINE = 6.5-8.5(A4)
FEB	8.260	. / 8.190	
MAR	8.170	8.050 / .	
APR	8.280	. / 8.240	
MAY	8.300	8.370 / 8.250	
JUN	8.460	8.450 / 8.510	
JUL	8.140	8.170 / 8.170	
AUG	8.230	. / 8.200	
OCT	8.110	8.160 / 8.500	
NOV	8.110	8.100 / 8.110	
DEC	8.030	8.030 / 8.030	
PHOSPHORUS FIL REACT (MG/L)		DET'N LIMIT = .5UG/L	GUIDELINE = N/A
FEB	BDL	. / .	
MAR	.000 <T	. / .	
APR	BDL	. / .	
MAY	BDL	. / .	
JUN	.000 <T	. / .	
JUL	BDL	. / .	
AUG	.001 <T	. / .	
OCT	.004	. / .	
NOV	.000 <T	. / .	
DEC	.004	. / .	
PHOSPHORUS TOTAL (MG/L)		DET'N LIMIT = 0.002	GUIDELINE = .40 (F2)
FEB	.005 <T	. / .	
MAR	.003 <T	. / .	
APR	BDL	. / .	
MAY	.002 <T	. / .	
JUN	BDL	. / .	
JUL	.003 <T	. / .	
AUG	.002 <T	. / .	
OCT	.027	. / .	
NOV	.007 <T	. / .	
DEC	.005 <T	. / .	
SULPHATE (MG/L)		DET'N LIMIT = .200	GUIDELINE = 500 (A3)
FEB	23.360	. / 23.080	
MAR	18.670	17.470 / .	
APR	19.900	. / 20.250	
MAY	19.480	19.770 / 19.800	
JUN	19.490	19.360 / 19.480	
JUL	19.150	19.280 / 18.960	
AUG	19.940	. / 19.970	
OCT	21.940	20.510 / 20.770	
NOV	20.400	18.660 / 19.250	
DEC	19.870	19.810 / 19.980	

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM OWEN SOUND SPRING SUPPLY 1990

	WATER TREATMENT PLANT				DISTRIBUTION SYSTEM
	RAW	SITE 1			
		STANDING		FREE FLOW	
TURBIDITY (FTU)			DET'N LIMIT = 0.02		GUIDELINE = 1 (A1)
FEB	.190	<T	.	.190	<T
MAR	.340		.300	.	
APR	.220		.	.360	
MAY	.500		.280	.510	
JUN	.110		.350	.300	
JUL	.150	<T	.200 <T	.200	
AUG	.280		.	.280	
OCT	.200	<T	.230 <T	.190	<T
NOV	1.100		.510	.530	
DEC	.400		.430	.390	

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM OWEN SOUND SPRING SUPPLY 1990

	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM
	RAW	SITE 1	
		STANDING / FREE FLOW	
METALS			
ALUMINUM (UG/L)		DET'N LIMIT = 0.004	GUIDELINE = 100 (A4)
FEB	4.600	. / 4.700	
MAR	5.300	6.100 / .	
APR	20.000	. / 21.000	
MAY	26.000	27.000 / 15.000	
JUN	2.400	2.800 / 2.700	
JUL	5.500	6.500 / 6.500	
AUG	7.000	. / 8.700	
OCT	1.500	1.800 / 2.100	
NOV	10.000	3.600 / 3.300	
DEC	2.400	2.500 / 2.500	
ARSENIC (UG/L)		DET'N LIMIT = 0.001	GUIDELINE = 25 (A1)
FEB	.330 <T	. / .430 <T	
MAR	BDL	.380 <T / .	
APR	BDL	. / .450 <T	
MAY	.210 <T	.460 <T / .550 <T	
JUN	BDL	.440 <T / .390 <T	
JUL	.210 <T	.570 <T / .340 <T	
AUG	.210 <T	. / .490 <T	
OCT	.240 <T	.540 <T / .530 <T	
NOV	BDL	.180 <T / .250 <T	
DEC	BDL	.270 <T / .190 <T	
BARIUM (UG/L)		DET'N LIMIT = 0.001	GUIDELINE = 1000 (A2)
FEB	25.000	. / 25.000	
MAR	22.000	22.000 / .	
APR	22.000	. / 21.000	
MAY	24.000	24.000 / 24.000	
JUN	25.000	25.000 / 25.000	
JUL	27.000	26.000 / 25.000	
AUG	24.000	. / 24.000	
OCT	25.000	24.000 / 24.000	
NOV	21.000	20.000 / 20.000	
DEC	23.000	22.000 / 23.000	
BORON (UG/L)		DET'N LIMIT = 0.01	GUIDELINE = 5000 (A1)
FEB	40.000	. / 40.000	
MAR	11.000 <T	12.000 <T / .	
APR	110.000	. / 130.000	
MAY	240.000	170.000 / 96.000	
JUN	17.000 <T	28.000 / 27.000	
JUL	47.000	46.000 / 45.000	
AUG	47.000	. / 53.000	
OCT	19.000 <T	22.000 / 21.000	
NOV	15.000 <T	14.000 <T / 17.000 <T	
DEC	13.000 <T	12.000 <T / 12.000 <T	

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM OWEN SOUND SPRING SUPPLY 1990

	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM	
	RAW	SITE 1		
		STANDING	FREE FLOW	
BERYLLIUM (UG/L)			DET'N LIMIT = 0.001	GUIDELINE = 6800 (D4)
FEB	.080 <T	.	.070 <T	
MAR	BDL	BDL	.	
APR	.190 <T	.	.090 <T	
MAY	.240 <T	.160 <T	.120 <T	
JUN	BDL	.070 <T	BDL	
JUL	BDL	BDL	BDL	
AUG	.110 <T	.	BDL	
OCT	BDL	BDL	BDL	
NOV	BDL	BDL	BDL	
DEC	BDL	BDL	BDL	
CADMIUM (UG/L)			DET'N LIMIT = 0.3	GUIDELINE = 5 (A1)
FEB	BDL	.	BDL	
MAR	BDL	BDL	.	
APR	BDL	.	BDL	
MAY	.090 <T	BDL	BDL	
JUN	BDL	BDL	BDL	
JUL	BDL	BDL	BDL	
AUG	BDL	.	BDL	
OCT	BDL	BDL	BDL	
NOV	BDL	BDL	BDL	
DEC	BDL	BDL	BDL	
COBALT (UG/L)			DET'N LIMIT = 0.001	GUIDELINE = N/A
FEB	BDL	.	BDL	
MAR	BDL	BDL	.	
APR	BDL	.	BDL	
MAY	BDL	BDL	.060 <T	
JUN	.110 <T	.120 <T	.220 <T	
JUL	BDL	BDL	BDL	
AUG	BDL	.	BDL	
OCT	.040 <T	.060 <T	.070 <T	
NOV	.050 <T	.120 <T	.070 <T	
DEC	BDL	BDL	BDL	
CHROMIUM (UG/L)			DET'N LIMIT = 0.001	GUIDELINE = 50 (A1)
FEB	5.000 <T	.	4.900 <T	
MAR	BDL	BDL	.	
APR	6.100	.	6.400	
MAY	7.500	5.500	8.600	
JUN	1.700 <T	5.000 <T	4.600 <T	
JUL	4.500 <T	4.000 <T	3.900 <T	
AUG	3.000 <T	.	3.300 <T	
OCT	4.500 <T	5.700	5.300	
NOV	2.000 <T	1.700 <T	4.100 <T	
DEC	BDL	BDL	BDL	

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM OWEN SOUND SPRING SUPPLY 1990

	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM	
	RAW	SITE 1		
		STANDING	FREE FLOW	
COPPER (UG/L)			DET'N LIMIT = 0.001	GUIDELINE = 1000 (A3)
FEB	38.000	.	170.000	
MAR	45.000	280.000	.	
APR	39.000	.	230.000	
MAY	29.000	210.000	200.000	
JUN	31.000	290.000	310.000	
JUL	45.000	460.000	470.000	
AUG	31.000	.	460.000	
OCT	38.000	1600.000	500.000	
NOV	26.000	1200.000	260.000	
DEC	44.000	320.000	260.000	
IRON (UG/L)			DET'N LIMIT = 0.002	GUIDELINE = 300 (A3)
FEB	BDL	.	32.000 <T	
MAR	BDL	13.000 <T	.	
APR	BDL	.	10.000 <T	
MAY	BDL	BDL	BDL	
JUN	BDL	BDL	BDL	
JUL	BDL	BDL	BDL	
AUG	BDL	.	7.100 <T	
OCT	BDL	8.700 <T	12.000 <T	
NOV	28.000 <T	25.000 <T	16.000 <T	
DEC	BDL	11.000 <T	13.000 <T	
MERCURY (UG/L)			DET'N LIMIT = 0.010	GUIDELINE = 1 (A1)
FEB	BDL	.	.	
MAR	BDL	.	.	
APR	BDL	.	.	
MAY	BDL	.	.	
JUN	BDL	.	.	
JUL	BDL	.	.	
AUG	BDL	.	.	
OCT	.100 <T	.	.	
NOV	BDL	.	.	
DEC	BDL	.	.	
MANGANESE (UG/L)			DET'N LIMIT = 0.001	GUIDELINE = 50 (A3)
FEB	.550	.	.780	
MAR	.870	.850	.	
APR	1.600	.	.370 <T	
MAY	1.100	.330 <T	.370 <T	
JUN	.850	.220 <T	.210 <T	
JUL	1.000	.470 <T	.470 <T	
AUG	.450 <T	.	.440 <T	
OCT	.760	.850	.840	
NOV	3.000	1.500	1.100	
DEC	1.100	.390 <T	.380 <T	

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM OWEN SOUND SPRING SUPPLY 1990

	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM	
	RAW	SITE 1		
		STANDING	FREE FLOW	
MOLYBDENUM (UG/L)			DET'N LIMIT = 0.001	GUIDELINE = N/A
FEB	.190 <T	.	.230 <T	
MAR	.220 <T	.250 <T	.	
APR	.230 <T	.	.230 <T	
MAY	.260 <T	.290 <T	.200 <T	
JUN	.170 <T	.170 <T	.220 <T	
JUL	.160 <T	.180 <T	.210 <T	
AUG	.200 <T	.	.230 <T	
OCT	.180 <T	.230 <T	.230 <T	
NOV	.240 <T	.220 <T	.230 <T	
DEC	.210 <T	.240 <T	.220 <T	
NICKEL (UG/L)			DET'N LIMIT = 0.001	GUIDELINE = 350 (D3)
FEB	BDL	.	BDL	
MAR	BDL	BDL	.	
APR	BDL	.	BDL	
MAY	BDL	BDL	BDL	
JUN	BDL	BDL	BDL	
JUL	BDL	BDL	BDL	
AUG	BDL	.	BDL	
OCT	.330 <T	.720 <T	.650 <T	
NOV	BDL	BDL	.440 <T	
DEC	BDL	BDL	BDL	
LEAD (UG/L)			DET'N LIMIT = 0.003	GUIDELINE = 10. (A1)
FEB	.160 <T	.	.390 <T	
MAR	.210 <T	.390 <T	.	
APR	.230 <T	.	.410 <T	
MAY	.190 <T	.480 <T	.530	
JUN	.270 <T	.810	.640	
JUL	.360 <T	.820	.810	
AUG	.210 <T	.	.790	
OCT	.210 <T	.820	.610	
NOV	.170 <T	.610	.360 <T	
DEC	.100 <T	.340 <T	.330 <T	
ANTIMONY (UG/L)			DET'N LIMIT = N/A	GUIDELINE = 146 (D4)
FEB	.360 <T	.	.310 <T	
MAR	.230 <T	.300 <T	.	
APR	.420 <T	.	.460 <T	
MAY	BDL	.150 <T	.320 <T	
JUN	.420 <T	.420 <T	.300 <T	
JUL	.340 <T	.310 <T	.320 <T	
AUG	.340 <T	.	.260 <T	
OCT	.490 <T	.410 <T	.490 <T	
NOV	.310 <T	.420 <T	.340 <T	
DEC	.420 <T	.400 <T	.460 <T	

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM OWEN SOUND SPRING SUPPLY 1990

	WATER TREATMENT PLANT			DISTRIBUTION SYSTEM
	RAW	SITE 1		
		STANDING	FREE FLOW	
SELENIUM (UG/L)			DET'N LIMIT = 0.001	GUIDELINE = 10 (A1)
FEB	BDL	.	BDL	
MAR	BDL	BDL	.	
APR	2.000 <T	.	BDL	
MAY	BDL	1.700 <T	1.500 <T	
JUN	BDL	BDL	BDL	
JUL	BDL	BDL	BDL	
AUG	BDL	.	1.100 <T	
OCT	BDL	BDL	BDL	
NOV	BDL	BDL	BDL	
DEC	BDL	BDL	BDL	
STRONTIUM (UG/L)			DET'N LIMIT = 0.001	GUIDELINE = N/A
FEB	190.000	.	190.000	
MAR	160.000	150.000	.	
APR	160.000	.	150.000	
MAY	180.000	170.000	170.000	
JUN	170.000	170.000	170.000	
JUL	170.000	170.000	170.000	
AUG	170.000	.	170.000	
OCT	170.000	170.000	170.000	
NOV	150.000	150.000	150.000	
DEC	160.000	160.000	160.000	
TITANIUM (UG/L)			DET'N LIMIT = N/A	GUIDELINE = N/A
FEB	7.700	.	8.800	
MAR	12.000	13.000	.	
APR	20.000	.	20.000	
MAY	19.000	19.000	15.000	
JUN	19.000	20.000	20.000	
JUL	11.000	11.000	11.000	
AUG	16.000	.	17.000	
OCT	8.100	8.100	7.800	
NOV	9.100	9.000	9.200	
DEC	9.500	10.000	9.900	
URANIUM (UG/L)			DET'N LIMIT = 0.02	GUIDELINE = 100 (A1)
FEB	.450 <T	.	.520	
MAR	.470 <T	.470 <T	.	
APR	.490 <T	.	.610	
MAY	.380 <T	.550	.530	
JUN	.480 <T	.560	.580	
JUL	.450 <T	.510	.520	
AUG	.420 <T	.	.470 <T	
OCT	.550	.590	.540	
NOV	.680	.600	.700	
DEC	.520	.570	.570	

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM OWEN SOUND SPRING SUPPLY 1990

	WATER TREATMENT PLANT			DISTRIBUTION SYSTEM
	RAW	SITE 1		
		STANDING	FREE FLOW	
VANADIUM (UG/L)			DET'N LIMIT = 0.001	GUIDELINE = N/A
FEB	.110 <T	.	.130 <T	
MAR	.060 <T	.070 <T	.	
APR	BDL	.	BDL	
MAY	.070 <T	BDL	.060 <T	
JUN	.090 <T	BDL	.080 <T	
JUL	BDL	.090 <T	BDL	
AUG	BDL	.	.070 <T	
OCT	BDL	BDL	BDL	
NOV	BDL	BDL	BDL	
DEC	BDL	BDL	BDL	
ZINC (UG/L)			DET'N LIMIT = 0.001	GUIDELINE = 5000 (A3)
FEB	1.600 <T	.	2.000 <T	
MAR	1.200 <T	2.200	.	
APR	1.100 <T	.	2.300	
MAY	1.900 <T	1.300 <T	1.700 <T	
JUN	1.700 <T	2.400	2.200	
JUL	4.500	2.200	2.100	
AUG	2.200	.	2.900	
OCT	2.100	13.000	3.600	
NOV	1.800 <T	6.000	2.200	
DEC	1.100 <T	2.200	1.700 <T	

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM OWEN SOUND SPRING SUPPLY 1990

	WATER TREATMENT PLANT			DISTRIBUTION SYSTEM
	RAW	SITE 1		
		STANDING	FREE FLOW	
	CHLOROAROMATICS			
HEXACHLOROETHANE (NG/L)			DET'N LIMIT = 1.000	GUIDELINE = 1900 (D4)
FEB	!QU	.	!QU	
MAR	BDL	BDL	.	
APR	BDL	.	BDL	
MAY	BDL	.	BDL	
JUN	!LA	.	BDL	
JUL	BDL	.	BDL	
AUG	BDL	.	BDL	
OCT	BDL	.	BDL	
NOV	BDL	.	3.000 <T	
DEC	BDL	.	!PE	

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM OWEN SOUND SPRING SUPPLY 1990

WATER TREATMENT PLANT — DISTRIBUTION SYSTEM

RAW — SITE 1

		STANDING	FREE FLOW	
POLYAROMATIC HYDROCARBONS				
PHENANTHRENE (NG/L)			DET'N LIMIT = 10.	GUIDELINE = 2.8 (D4T)
FEB	IQU	.	.	
MAR	BDL	.	.	
APR	BDL	.	.	
MAY	BDL	.	.	
JUN	BDL	.	.	
JUL	BDL	.	.	
AUG	BDL	.	50.000 <T	
OCT	BDL	.	20.000 <T	
NOV	BDL	.	20.000 <T	
DEC	BDL	.	.	

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM OWEN SOUND SPRING SUPPLY 1990

WATER TREATMENT PLANT — DISTRIBUTION SYSTEM

RAW — SITE 1

		STANDING	FREE FLOW
PHENOLICS (UG/L)	PHENOLICS	DET'N LIMIT = .100	GUIDELINE = 2 (A4)
FEB	BDL	.	.
MAR	BDL	.	.
APR	BDL	.	.
MAY	BDL	.	.
JUN	BDL	.	.
JUL	BDL	.	.
AUG	BDL	.	.
OCT	BDL	.	.
NOV	1.000	.	.
DEC	1.000 <T	.	.

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM OWEN SOUND SPRING SUPPLY 1990

	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM
	RAW	SITE 1	
		STANDING / FREE FLOW	
VOLATILES			
TOLUENE (UG/L)		DET'N LIMIT = 0.10	GUIDELINE = 24 (A3)
FEB	BDL	BDL	
MAR	BDL	.	
APR	BDL	BDL	
MAY	BDL	BDL	
JUN	BDL	BDL	
JUL	BDL	.100 <T	
AUG	BDL	BDL	
OCT	BDL	.050 <T	
NOV	BDL	.200 <T	
DEC	BDL	.200 <T	
ETHYLBENZENE (UG/L)		DET'N LIMIT = 0.05	GUIDELINE = 2.4 (A3)
FEB	BDL	BDL	
MAR	.100 <T	.	
APR	.050 <T	.100 <T	
MAY	BDL	BDL	
JUN	.050 <T	.050 <T	
JUL	BDL	.050 <T	
AUG	.050 <T	BDL	
OCT	BDL	.050 <T	
NOV	.050 <T	.050 <T	
DEC	.100 <T	.100 <T	
M-XYLENE (UG/L)		DET'N LIMIT = 0.10	GUIDELINE = 300 (A3*)
FEB	BDL	BDL	
MAR	BDL	.	
APR	BDL	BDL	
MAY	BDL	BDL	
JUN	BDL	BDL	
JUL	BDL	BDL	
AUG	BDL	BDL	
OCT	BDL	.100 <T	
NOV	BDL	.200 <T	
DEC	BDL	.300 <T	
O-XYLENE (UG/L)		DET'N LIMIT = 0.05	GUIDELINE = 300 (A3*)
FEB	BDL	BDL	
MAR	BDL	.	
APR	BDL	BDL	
MAY	BDL	BDL	
JUN	BDL	BDL	
JUL	BDL	BDL	
AUG	BDL	BDL	
OCT	BDL	.050 <T	
NOV	BDL	.100 <T	
DEC	BDL	.150 <T	

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM OWEN SOUND SPRING SUPPLY 1990

	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM
	RAW	SITE 1	
		STANDING / FREE FLOW	
STYRENE (UG/L)		DET'N LIMIT = N/A	GUIDELINE = 100 (D1)
FEB	BDL	BDL	
MAR	.150 <T	.	
APR	.100 <T	.100 <T	
MAY	.100 <T	BDL	
JUN	.150 <T	.100 <T	
JUL	.050 <T	.100 <T	
AUG	.100 <T	.050 <T	
OCT	.050 <T	BDL	
NOV	.100 <T	.100 <T	
DEC	.200 <T	.100 <T	
METHYLENE CHLORIDE (UG/L)		DET'N LIMIT = 0.50	GUIDELINE = 50 (A1)
FEB	BDL	BDL	
MAR	BDL	.	
APR	BDL	BDL	
MAY	BDL	BDL	
JUN	BDL	BDL	
JUL	BDL	.500 <T	
AUG	BDL	BDL	
OCT	BDL	BDL	
NOV	BDL	BDL	
DEC	BDL	BDL	
1,1 DICHLOROETHANE (UG/L)		DET'N LIMIT = 0.100	GUIDELINE = N/A
FEB	.300 <T	.300 <T	
MAR	BDL	.	
APR	.200 <T	.200 <T	
MAY	.200 <T	.200 <T	
JUN	.300 <T	.300 <T	
JUL	.200 <T	.300 <T	
AUG	.300 <T	.300 <T	
OCT	.200 <T	.200 <T	
NOV	.100 <T	.200 <T	
DEC	.200 <T	.200 <T	
CHLOROFORM (UG/L)		DET'N LIMIT = 0.10	GUIDELINE = 350 (A1+)
FEB	BDL	11.900	
MAR	BDL	.	
APR	BDL	14.800	
MAY	BDL	11.800	
JUN	BDL	7.300	
JUL	BDL	9.800	
AUG	BDL	9.400	
OCT	BDL	13.600	
NOV	BDL	18.100	
DEC	BDL	13.000	

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM OWEN SOUND SPRING SUPPLY 1990

	WATER TREATMENT PLANT			DISTRIBUTION SYSTEN
	RAW	SITE 1		
		STANDING	FREE FLOW	
111, TRICHLOROETHANE (UG/L)			DET'N LIMIT = 0.02	GUIDELINE = 200 (D1)
FEB	.160 <T	.	.140 <T	
MAR	.120 <T	.	.	
APR	.180 <T	.	.120 <T	
MAY	.140 <T	.	.140 <T	
JUN	.160 <T	.	.160 <T	
JUL	.140 <T	.	.120 <T	
AUG	.160 <T	.	.140 <T	
OCT	.140 <T	.	.120 <T	
NOV	.100 <T	.	.100 <T	
DEC	.120 <T	.	.120 <T	
DICHLOROBROMOMETHANE (UG/L)			DET'N LIMIT = 0.05	GUIDELINE = 350 (A1+)
FEB	BDL	.	6.100	
MAR	BDL	.	.	
APR	BDL	.	5.050	
MAY	BDL	.	5.000	
JUN	BDL	.	5.300	
JUL	BDL	.	5.900	
AUG	BDL	.	7.050	
OCT	BDL	.	6.450	
NOV	BDL	.	4.950	
DEC	BDL	.	5.050	
CHLORODIBROMOMETHANE (UG/L)			DET'N LIMIT = 0.10	GUIDELINE = 350 (A1+)
FEB	BDL	.	2.100	
MAR	BDL	.	.	
APR	BDL	.	1.000	
MAY	BDL	.	1.300	
JUN	BDL	.	2.600	
JUL	BDL	.	2.600	
AUG	BDL	.	4.100	
OCT	BDL	.	1.900	
NOV	BDL	.	.800 <T	
DEC	BDL	.	1.100	
T-CHLOROETHYLENE (UG/L)			DET'N LIMIT = 0	GUIDELINE = 5 (D1)
FEB	BDL	.	BDL	
MAR	.100 <T	.	.	
APR	BDL	.	BDL	
MAY	BDL	.	BDL	
JUN	BDL	.	BDL	
JUL	BDL	.	BDL	
AUG	BDL	.	BDL	
OCT	BDL	.	BDL	
NOV	BDL	.	BDL	
DEC	BDL	.	BDL	

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM OWEN SOUND SPRING SUPPLY 1990

	WATER TREATMENT PLANT			DISTRIBUTION SYSTEM
	RAW	SITE 1		
		STANDING	FREE FLOW	
BROMOFORM (UG/L)			DET'N LIMIT = 0.20	GUIDELINE = 350 (A1+)
FEB	BDL	.	BDL	
MAR	BDL	.	.	
APR	BDL	.	BDL	
MAY	BDL	.	BDL	
JUN	BDL	.	.200 <T	
JUL	BDL	.	.200 <T	
AUG	BDL	.	.600 <T	
OCT	BDL	.	BDL	
NOV	BDL	.	BDL	
DEC	BDL	.	BDL	
TOTL TRIHALOMETHANES (UG/L)			DET'N LIMIT = 0.50	GUIDELINE = 350 (A1)
FEB	BDL	.	20.100	
MAR	BDL	.	.	
APR	BDL	.	20.900	
MAY	BDL	.	18.100	
JUN	BDL	.	15.450	
JUL	BDL	.	18.600	
AUG	BDL	.	21.000	
OCT	BDL	.	21.900	
NOV	BDL	.	23.900	
DEC	BDL	.	19.150	

TRACE LEVELS OF TOLUENE ARE LABORATORY ARTIFACTS DERIVED FROM THE ANALYTICAL METHODOLOGY.

TRACE LEVELS OF STYRENE ARE CONSIDERED TO BE LABORATORY ARTIFACTS RESULTING FROM THE LABORATORY SHIPPING CONTAINERS.

TABLE 6
DRINKING WATER SURVEILLANCE PROGRAM 1990

SCAN/PARAMETER	UNIT	DETECTION LIMIT	GUIDELINE
BACTERIOLOGICAL			
FECAL COLIFORM MEMBRANE FILTRATION	CT/100ML	0	0 (A1)
STANDARD PLATE COUNT MEMBRANE FILT.	CT/ML	0	500/ML (A3)
TOTAL COLIFORM BACKGROUND MF	CT/100ML	0	N/A
TOTAL COLIFORM MEMBRANE FILTRATION	CT/100ML	0	5/100ML (A1)
CHEMISTRY (FLD)			
FIELD COMBINED CHLORINE RESIDUAL	MG/L	0	N/A
FIELD TOTAL CHLORINE RESIDUAL	MG/L	0	N/A
FIELD FREE CHLORINE RESIDUAL	MG/L	0	N/A
FIELD PH	DMNSLESS	N/A	6.5-8.5 (A3)
FIELD TEMPERATURE	DEG.C	N/A	15.0 (A3)
FIELD TURBIDITY	FTU	N/A	1.0 (A1)
CHEMISTRY (LAB)			
ALKALINITY	MG/L	0.2	30-500 (A3)
AMMONIUM TOTAL	MG/L	0.002	0.05 (F2)
CALCIUM	MG/L	0.2	100 (F2)
CHLORIDE	MG/L	0.2	250 (A3)
COLOUR	TCU	0.5	5.0 (A3)
CONDUCTIVITY	UMHO/CM	1.0	400 (F2)
CYANIDE	MG/L	0.001	0.2 (A1)
DISSOLVED ORGANIC CARBON	MG/L	0.1	5.0 (A3)
FLUORIDE	MG/L	0.01	2.4 (A1)
HARDNESS	MG/L	0.5	80-100 (A4)
LANGELIERS INDEX	DMNSLESS	N/A	N/A
MAGNESIUM	MG/L	0.1	30.0 (F2)
NITRITE	MG/L	0.001	1.0 (A1)
NITROGEN TOTAL KJELDAHL	MG/L	0.02	N/A
PH	DMNSLESS	N/A	6.5-8.5 (A4)
PHOSPHORUS FIL REACT	MG/L	0.0005	N/A
PHOSPHORUS TOTAL	MG/L	0.002	0.4 (F2)
SODIUM	MG/L	0.2	200 (A4)
SULPHATE	MG/L	0.2	500 (A3)
TOTAL NITRATES	MG/L	0.005	10.0 (A1)
TURBIDITY	FTU	0.05	1.0 (A1)
CHLOROAROMATICS			
123 TRICHLOROBENZENE	NG/L	5.0	N/A
1234 TETRACHLOROBENZENE	NG/L	1.0	N/A
1235 TETRACHLOROBENZENE	NG/L	1.0	N/A
124 TRICHLOROBENZENE	NG/L	5.0	10000 (I)
1245-TETRACHLOROBENZENE	NG/L	1.0	38000 (D4)
135 TRICHLOROBENZENE	NG/L	5.0	N/A
236 TRICHLOROTOLUENE	NG/L	5.0	N/A
245 TRICHLOROTOLUENE	NG/L	5.0	N/A
26A TRICHLOROTOLUENE	NG/L	5.0	N/A
HEXACHLOROBENZENE	NG/L	1.0	10 (C1)
HEXACHLOROBUTADIENE	NG/L	1.0	450 (D4)
HEXACHLOROCYCLOPENTADIENE	NG/L	5.0	206000 (D4)
HEXACHLOROETHANE	NG/L	1.0	1900 (D4)
OCTACHLOROSTYRENE	NG/L	1.0	N/A
PENTACHLOROBENZENE	NG/L	1.0	74000 (D4)
CHLOROPHENOLS			
234 TRICHLOROPHENOL	NG/L	100.0	N/A
2345 TETRACHLOROPHENOL	NG/L	20.0	N/A
2356 TETRACHLOROPHENOL	NG/L	10.0	N/A

TABLE 6
DRINKING WATER SURVEILLANCE PROGRAM 1990

SCAN/PARAMETER	UNIT	DETECTION LIMIT	GUIDELINE
245 TRICHLOROPHENOL	NG/L	100.0	2600000 (D4)
246 TRICHLOROPHENOL	NG/L	20.0	5000 (A1)
PENTACHLOROPHENOL	NG/L	10.0	60000 (A1)
METALS			
ALUMINUM	UG/L	0.10	100 (A4)
ANTIMONY	UG/L	0.05	146 (D4)
ARSENIC	UG/L	0.10	25 (A1)
BARIUM	UG/L	0.05	1000 (A2)
BERYLLIUM	UG/L	0.05	6800 (D4)
BORON	UG/L	2.00	5000 (A1)
CADMIUM	UG/L	0.05	5 (A1)
CHROMIUM	UG/L	0.50	50 (A1)
COBALT	UG/L	0.02	N/A
COPPER	UG/L	0.50	1000 (A3)
IRON	UG/L	6.00	300 (A3)
LEAD	UG/L	0.05	10 (A1)
MANGANESE	UG/L	0.05	50 (A3)
MERCURY	UG/L	0.02	1 (A1)
MOLYBDENUM	UG/L	0.05	N/A
NICKEL	UG/L	0.20	350 (D3)
SELENIUM	UG/L	1.00	10 (A1)
SILVER	UG/L	0.05	50 (A1)
STRONTIUM	UG/L	0.10	N/A
THALLIUM	UG/L	0.05	13 (D4)
TITANIUM	UG/L	0.50	N/A
URANIUM	UG/L	0.05	100 (A1)
VANADIUM	UG/L	0.05	N/A
ZINC	UG/L	0.20	5000 (A3)
PAH			
ANTHRACENE	NG/L	1.0	N/A
BENZO(A) ANTHRACENE	NG/L	20.0	N/A
BENZO(A) PYRENE	NG/L	5.0	10.0 (A1)
BENZO(B) CHRYSENE	NG/L	2.0	N/A
BENZO(B) FLUORANTHENE	NG/L	10.0	N/A
BENZO(E) PYRENE	NG/L	50.0	N/A
BENZO(G,H,I) PERYLENE	NG/L	20.0	N/A
BENZO(K) FLUORANTHENE	NG/L	1.0	N/A
CHRYSENE	NG/L	50.0	N/A
CORONENE	NG/L	10.0	N/A
DIBENZO(A,H) ANTHRACENE	NG/L	10.0	N/A
DIMETHYL BENZO(A) ANTHRACENE	NG/L	5.0	N/A
FLUORANTHENE	NG/L	20.0	42000.0 (D4)
INDENO(1,2,3-C,D) PYRENE	NG/L	20.0	N/A
PERYLENE	NG/L	10.0	N/A
PHENANTHRENE	NG/L	10.0	N/A
PYRENE	NG/L	20.0	N/A
PESTICIDES & PCB			
ALACHLOR (LASSO)	NG/L	500.0	5000 (A2)
ALDRIN	NG/L	1.0	700 (A1)
ALPHA HEXACHLOROCYCLOHEXANE (BHC)	NG/L	1.0	700 (G)
ALPHA CHLORDANE	NG/L	2.0	7000 (A1)
AMETRINE	NG/L	50.0	300000 (D3)
ATRATONE	NG/L	50.0	N/A
ATRAZINE	NG/L	50.0	60000 (A2)
DES ETHYL ATRAZINE	NG/L	200.0	60000 (A2)
BETA HEXACHLOROCYCLOHEXANE (BHC)	NG/L	1.0	300 (G)
CYANAZINE (BLADEX)	NG/L	100.0	10000 (A2)
O,P-DDD	NG/L	5.0	10 (I)
DIELDRIN	NG/L	2.0	700 (A1)
ENDOSULFAN 1 (THIODAN I)	NG/L	2.0	74000 (D4)
ENDOSULFAN 2 (THIODAN II)	NG/L	5.0	74000 (D4)

TABLE 6
DRINKING WATER SURVEILLANCE PROGRAM 1990

SCAN/PARAMETER	UNIT	DETECTION LIMIT	GUIDELINE
ENDOSULFAN SULPHATE (THIODAN SULPHATE)	NG/L	5.0	N/A
ENDRIN	NG/L	5.0	1600 (D3)
GAMMA CHLORDANE	NG/L	2.0	7000 (A1)
HEPTACHLOR	NG/L	1.0	3000 (A1)
HEPTACHLOR EPOXIDE	NG/L	1.0	3000 (A1)
LINDANE (GAMMA BHC)	NG/L	1.0	4000 (A1)
METHOXYCHLOR	NG/L	5.0	900000 (A1)
METOLACHLOR	NG/L	500.0	50000 (A2)
METRIBUZIN (SENCOR)	NG/L	100.0	80000 (A1)
MIREX	NG/L	5.0	N/A
P,P-DDD	NG/L	5.0	N/A
O,P-DDT	NG/L	5.0	30000 (A1)
OXYCHLORDANE	NG/L	2.0	N/A
PCB	NG/L	20.0	3000 (A2)
PPDDE	NG/L	1.0	30000 (A1)
PPDDT	NG/L	5.0	30000 (A1)
PROMETONE	NG/L	50.0	52500 (D3)
PROMETRYNE	NG/L	50.0	1000 (A2)
PROPAZINE	NG/L	50.0	700000 (D3)
SIMAZINE	NG/L	50.0	10000 (A2)
D-ETHYL SIMAZINE	NG/L	200.0	10000 (A2)
TOXAPHENE	NG/L	500.0	5000 (A1)
PHENOLICS			
PHENOLICS (UNFILTERED REACTIVE)	UG/L	0.2	2 (A4)
SPECIFIC PESTICIDES			
2,4 D PROPIONIC ACID	NG/L	100.	N/A
2,4,5-TRICHLOROPHENOXY ACETIC ACID	NG/L	50.	280000 (A1)
2,4-DICHLOROBUTYRIC ACID (2,4-D)	NG/L	100.	100000 (A1)
24-DICHLORORPHENOXYBUTYRIC ACID (24-DB)	NG/L	200.	18000 (B3)
BUTYLATE (SUTAN)	NG/L	2000.	245000 (D3)
CARBARYL (SEVIN)	NG/L	200.	90000 (A1)
CARBOFURAN	NG/L	2000.	90000 (A1)
CHLORPYRIFOS (DURSBAN)	NG/L	20.	N/A
CICP (CHLORPROPHAM)	NG/L	2000.	350000 (G)
DIALLATE	NG/L	2000.	N/A
DIAZINON	NG/L	20.	20000 (A1)
DICAMBA	NG/L	50.	120000 (A1)
DICHLOROVOS	NG/L	20.	N/A
EPTAM	NG/L	2000.	N/A
ETHION	NG/L	20.	35000 (G)
IPC	NG/L	2000.	N/A
MALATHION	NG/L	20.	190000 (A1)
METHYL PARATHION	NG/L	50.	7000 (B3)
METHYLTRITHION	NG/L	20.	N/A
MEVINPHOS	NG/L	20.	N/A
PARATHION	NG/L	20.	50000 (A1)
PHORATE (THIMET)	NG/L	20.	2000 (A2)
PROPOXUR (BAYGON)	NG/L	2000.	140000 (D3)
RELDAN	NG/L	20.	N/A
RONNEL	NG/L	20.	N/A
SILVEX (2,4,5-TP)	NG/L	20.	10000 (A1)
VOLATILES			
1,1 DICHLOROETHANE	UG/L	0.10	N/A
1,1 DICHLOROETHYLENE	UG/L	0.10	7 (D1)
1,2 DICHLOROBENZENE	UG/L	0.05	200 (A1)
1,2 DICHLOROETHANE	UG/L	0.05	5 (A1)

TABLE 6
DRINKING WATER SURVEILLANCE PROGRAM 1990

SCAN/PARAMETER	UNIT	DETECTION LIMIT	GUIDELINE
1,2 DICHLOROPROPANE	UG/L	0.05	5 (D1)
1,3 DICHLOROBENZENE	UG/L	0.10	3750 (D3)
1,4 DICHLOROBENZENE	UG/L	0.10	5 (A1)
111, TRICHLOROETHANE	UG/L	0.02	200 (D1)
112 TRICHLOROETHANE	UG/L	0.05	0.6 (D4)
1122 TETRACHLOROETHANE	UG/L	0.05	0.17(D4)
BENZENE	UG/L	0.05	5 (A1)
BROMOFORM	UG/L	0.20	350 (A1+)
CARBON TETRACHLORIDE	UG/L	0.20	5 (A1)
CHLOROBENZENE	UG/L	0.10	1510 (D3)
CHLORODIBROMOMETHANE	UG/L	0.10	350 (A1+)
CHLOROFORM	UG/L	0.10	350 (A1+)
DICHLOROBROMOMETHANE	UG/L	0.05	350 (A1+)
ETHLYENE DIBROMIDE	UG/L	0.05	50 (D1)
ETHYLBENZENE	UG/L	0.05	2.4 (A3)
M-XYLENE	UG/L	0.10	300 (A3*)
METHYLENE CHLORIDE	UG/L	0.50	50 (A1)
O-XYLENE	UG/L	0.05	300 (A3*)
P-XYLENE	UG/L	0.10	300 (A3*)
STYRENE	UG/L	0.05	100 (D1)
TETRACHLOROETHYLENE	UG/L	0.05	5 (D1)
TRANS 1,2 DICHLOROETHYLENE	UG/L	0.10	70 (D1)
TOLUENE	UG/L	0.05	24 (A3)
TOTAL TRIHALOMETHANES	UG/L	0.50	350 (A1)
TRICHLOROETHYLENE	UG/L	0.10	50 (A1)

Appendix A

DRINKING WATER SURVEILLANCE PROGRAM
PROGRAM DESCRIPTION

The Drinking Water Surveillance Program (DWSP) for Ontario monitors drinking water quality at municipal water supply systems. The DWSP Database Management System provides a computerized drinking water quality information system for the supplies monitored. The objectives of the program are to provide:

- immediate, reliable, current information on drinking water quality;
- a flagging mechanism for guideline exceedance;
- a definition of contaminant levels and trends;
- a comprehensive background for remedial action;
- a framework for assessment of new contaminants; and
- an indication of treatment efficiency of plant processes.

PROGRAM

The DWSP officially began in April 1986 and is designed to eventually include all municipal water supplies in Ontario. In 1990, 76 systems were being monitored. Water supply locations have been prioritized for surveillance based primarily on criteria such as population density, probability of contamination and geographical location.

An ongoing assessment of future monitoring requirements at each location will be made. Monitoring will continue at the initial locations at an appropriate level and further locations will be phased into the program as resources permit.

A major goal of the program is to collect valid water quality data in context with plant operational characteristics at the time of sampling. As soon as sufficient data have been accumulated and analyzed, both the frequency of sampling and the range of parameters may be adjusted accordingly.

Assessments are carried out at all locations prior to initial sampling, in order to acquire complete plant process and distribution system details and to designate (and retrofit if necessary) all sampling systems and locations. This ensures that the sampled water is a reflection of the water itself.

Samples are taken of raw (ambient water) and treated water at the treatment plant and of consumer's tap water in the distribution system. In order to determine possible effects of distribution on water quality, both standing and free flow water in old and new sections of the distribution system are sampled. Sampling is carried out by operational personnel who have been trained in applicable procedures.

Comprehensive standardized procedures and field test kits are supplied to sampling personnel. This ensures that samples are taken and handled according to standard protocols and that field testing will supply reliable data. All field and laboratory analyses are carried out using "approved documented procedures". Most laboratory analyses are carried out by the Ministry of Environment (MOE), Laboratory Services Branch. Radionuclides are analyzed by the Ministry of Labour.

DATA REPORTING MECHANISM

When the analytical results are transferred from the MOE laboratory into the DWSP system, printouts of the completed analyses are sent to the MOE District Officer, the appropriate operational staff and are also retained by the DWSP unit.

PROGRAM INPUTS AND OUTPUTS

There are four major inputs and four major outputs in the program.

Program Input - Plant and Distribution System Description

The system description includes plant specific non-analytical information acquired through a questionnaire and an initial plant visit. During the initial assessment of the plant and distribution system, questionnaire content is verified and missing information added. It is intended that all data be kept current with scheduled annual updates.

The Plant and Distribution System Description consists of the following seven components:

1. PROCESS COMPONENT INVENTORY

All physical and chemical processes to which the water is subjected, from the intake pipe to the consumers' tap (where possible), are documented. These include: process type, general description of physical structures, material types, sizes, and retention time for each process within the plant. The processes may be as simple as transmission or as complex as carbon adsorption.

2. TREATMENT CHEMICALS

Chemicals used in the treatment processes, their function, application point, supplier and brand-name are recorded. Chemical dosages applied on the day of sampling are recorded in DWSP.

3. PROCESS CONTROL MEASUREMENTS

Documentation of in-plant monitoring of process parameters (eg. turbidity, chlorine residuals, pH, aluminum residuals) including methods used, monitoring locations and frequency is contained in this section. Except for the recorded Field Data, in-plant monitoring results are not retained in DWSP but are retained by the water treatment plant personnel.

4. DESIGN FLOW AND RETENTION TIME

Hydraulic capacity, designed and actual, is noted here. Retention time (the time that a block of water is retained in the plant) is also noted. Maximum, minimum and average flow, as well as a record of the flow rate on the day of sampling, are recorded in DWSP.

5. DISTRIBUTION SYSTEM DESCRIPTION

This area includes the storage and transmission characteristics of the distribution system after the water leaves the plant.

6. SAMPLING SYSTEM

Each plant is assessed for its adequacy in terms of the sampling of bacteriological, organic and inorganic parameters. Prime considerations in the assessment and design of the sampling system are:

i/ the sample is an accurate representation of the actual water condition, eg. raw water has had no chemical treatment;

ii/ the water being sampled is not being modified by the sampling system;

iii/ the sample tap must be in a clean area of the plant, preferably a lab area; and

iv/ the sample lines must be organically inert (no plastic, ideally stainless steel).

It is imperative that the sampled water be a reflection not of the sampling system but of the water itself.

The sampling system documentation includes: origin of the water; date sampling was initiated; size, length and material type (intake,

discharge and tap); pump characteristics (model, type, capacity); and flow rate.

7. PERSONNEL
This section contains the names, addresses and phone numbers of current plant management and operational staff, distribution system management and operational staff, Medical Officer of Health and appropriate MOE personnel associated with the plant.

Program Input - Field Data

The second major input to DWSP is field data. Field data is collected at the plant and from the distribution system sites on the day of sampling. Field data consists of general operating conditions and the results of testing for field parameters. General operating conditions include chemicals used, dosages, flow and retention time on the day of sampling, as well as, monthly maximum, minimum and average flows. Field parameters include turbidity, chlorine residuals (free, combined and total), temperature and pH. These parameters are analyzed according to standardized DWSP protocols to allow for interplant comparison.

Program Input - Laboratory Analytical Data

The third major input to DWSP is Laboratory Analytical Data. Samples gathered from the raw, treated and distribution sampling sites are analyzed for the presence of approximately 180 parameters at a frequency of two to twelve times per year. Sixty-five percent of the parameters are organic. Parameters measured may have health or aesthetic implications when present in drinking water. Many of the parameters may be used in the treatment process or may be treatment by-products. Due to the nature of certain analytical instruments, parameters may be measured in a "scan" producing some results for parameters that are not on the DWSP priority list, but which may be of interest. The majority of parameters are measured on a routine basis. Those that are technically more difficult and/or costly to analyze, however, are done less frequently. These include Specific Pesticides and Chlorophenols.

Although the parameter list is extensive, additional parameters with the potential to cause health or aesthetic related problems may be added provided reliable analytical and sampling methods exist.

All laboratory generated data is derived from standardized, documented analytical protocols. The analytical method is an integral part of the data and as methods change, notation will be made and comparison data documented.

Program Input - Parameter Reference Information

The fourth major input to DWSP is Parameter Reference Information. This is a catalogue of information for each substance analyzed on DWSP. It includes parameter name and aliases, physical and chemical properties, basic toxicology, world-wide health limits, treatment methods and uses. The Parameter Reference Information is computerized and can be accessed through the Query function of the DWSP database. An example is shown in figure 1.

Program output - Query

All DWSP information is easily accessed through the Query function, therefore, anything from addresses of plant personnel to complete water quality information for a plant's water supply is instantly available. The DWSP computer system makes relatively complex inquiries manageable. A personal password allowing access into the DWSP query mode in all MOE offices is being developed by the DWSP group.

Program Output - Action Alerts

Drinking Water quality in Ontario is evaluated against provincial objectives as outlined in the Ontario Drinking Water Objectives publication. Should the reported level of a substance in treated water exceed the Ontario Drinking Water Objective, an "Action Alert" requiring resampling and confirmation is issued. This assures that operational staff, health authorities and the public are notified as soon as possible of the confirmation of an exceedance and remedial action taken. This report supplies a history of the occurrence of past exceedances at the plant plus a historical summary on the parameter of concern.

In the absence of Ontario Drinking Water Objectives, guidelines/limits from other agencies are used. The Parameter Listing System, published by MOE (ISBN 0-7729-4461-X), catalogues and keeps current guidelines for 650 parameters from agencies throughout the world. If these guidelines are exceeded, the results are flagged and evaluated by DWSP personnel. An "Action Alert" will be issued if warranted.

Program Output - Report Generation

Custom reports can be generated from DWSP to meet MOE Regional needs and to respond to public requests.

Program Output - Annual Reports

It is the practice of DWSP to produce an annual report containing analytical data along with companion plant information.

FIG.1

MOE - DRINKING WATER ASSESSMENT PROGRAM (DWSP)

PARAMETER REFERENCE INFORMATION

BENZENE (B2001P) VOLATILES

CLASS: HEALTH METHOD: POCODO UNIT: µg/L

SOURCE	FROM	TO	METHOD	GUIDELINE	UNIT	NOTE
CAL C	85/01			0.700	µg/L	AL
CDWG C	87/01			5.000	µg/L	MAC
EPA C	87/07			5.000	µg/L	MCL
EPAA C	80/11			6.600	µg/L	AMBIENT **
FERC C	84/05			1.000	µg/L	MCL
WHO C	84/01			10.000	µg/L	GV

DESCRIPTION:**NAME:** BENZENE
CAS#: 71-43-2
MOLECULAR FORMULAE: C_6H_6
DETECTION LIMIT: (FOR METHOD POCODO) 0.05 µg/L
SYNONYMS: BENZOL; BENZOLE; COAL NAPHTHA; CARBON OIL (27). CYCLOHEXATRIENE (41).
CHARACTERISTICS: COLOURLESS TO LIGHT-YELLOW, MOBILE, NON-POLAR LIQUID, OF HIGHLY REFRACTIVE NATURE, AROMATIC ODOUR; VAPOURS BURN WITH SMOKING FLAME (30).
PROPERTIES: SOLUBILITY IN WATER: 1780-1800 mg/L AT 25C (41). THRESHOLD ODOUR: 0.5 - 10 PPM IN WATERTHRESHOLD TASTE: 0.5 mg/L IN WATER (39).
ENVIRONMENTAL FATE: MAY BIOACCUMULATE IN LIVING ORGANISMS AND APPEARS TO ACCUMULATE IN ANIMAL TISSUES THAT EXHIBIT A HIGH LIPID CONTENT OR REPRESENT MAJOR METABOLIC SITES, SUCH AS LIVER OR BRAIN; SMALL QUANTITIES EVAPORATE FROM SOILS OR ARE DEGRADED RATHER QUICKLY (80).
SOURCES: COMMERCIAL: PETROLEUM REFINING; SOLVENT RECOVERY; COAL TAR DISTILLATION (39); FOOD PROCESSING AND TANNING INDUSTRIES; COMBUSTION OF CAR EXHAUST.
ENVIRONMENTAL: POSSIBLE SOURCE IS RUNOFF.

USES: DETERGENTS; NYLON; INTERMEDIATE IN PRODUCTION OF OTHER COMPOUNDS, SUCH AS PESTICIDES; SOLVENT FOR EXTRACTION AND RECTIFICATION IN RUBBER INDUSTRY; DEGREASING AND CLEANSING AGENT; GASOLINE.

TOXICITY: RATING: 4 (VERY TOXIC).
ACUTE: IRRITATING TO MUCOUS MEMBRANES; SYMPTOMS INCLUDE RESTLESSNESS, CONVULSIONS, EXCITEMENT, DEPRESSION; DEATH MAY FOLLOW RESPIRATORY FAILURE.
CHRONIC: MAY CAUSE ANAEMIA AND LEUKAEMIA (45); MUTAGENIC.
MODE OF ACTION: CHROMOABERRATION IN LYMPHOCYTE CULTURES.

CARCINOGENICITY: A KNOWN HUMAN CARCINOGEN.

REMOVAL: THE FOLLOWING PROCESSES HAVE BEEN SUCCESSFUL IN REMOVING BENZENE FROM WASTEWATER: GAC ADSORPTION, PRECIPITATION WITH ALUM AND SUBSEQUENT REMOVAL VIA SEDIMENTATION, COAGULATION AND FLOCCULATION, SOLVENT EXTRACTION, OXIDATION

ADDITIONAL PROPERTIES:
MOLECULAR WEIGHT: 78.12
MELTING POINT: 5.5°C (27).
BOILING POINT: 80.1°C (27).
SPECIFIC GRAVITY: 0.8790 AT 20°C (27).
VAPOUR PRESSURE: 100 MM AT 26.1°C (27).
HENRY'S LAW CONSTANT: 0.00555 ATM-M3/MOLE (41).
LOG OCT./WATER PARTITION COEFFICIENT: 1.95 TO 2.13 (39).
CARBON ADSORPTION: K=1.0; 1/N=1.6; R=0.97; PH=5.3 (41)SEDIMENT/WATER PARTITION COEFFICIENT: NO DATA

NOTES: EPA PRIORITY POLLUTANT.

Appendix B

DWSP SAMPLING GUIDELINE

i) Raw and Treated at Plant

General Chemistry	-500 mL plastic bottle (PET 500) -rinse bottle and cap with sample water three times -fill to 2 cm from top
Bacteriological	-220 mL plastic bottle with white seal on cap -do not rinse bottle, preservative has been added -avoid touching bottle neck or inside of cap -fill to top of red label as marked
Metals	-500 mL plastic bottle (PET 500) -rinse bottle and cap three times -fill to 2 cm from top -add 10 drops nitric acid (HNO_3) (**Caution:** HNO_3 is corrosive)
Volatiles (duplicates) (OPOPUP)	-45 mL glass vial with septum (teflon side must be in contact with sample) -do not rinse bottle -fill bottle completely without bubbles
Organics (OWOC),(OWTRI),(OAPAHX)	-1 L amber glass bottle per scan -do not rinse bottle -fill to 2 cm from top -when 'special pesticides' are requested three extra bottles must be filled

Cyanide	-500 mL plastic bottle (PET 500) -rinse bottle and cap three times -fill to 2 cm from top -add 10 drops sodium hydroxide (NaOH) (**Caution:** NaOH is corrosive)
Mercury	-250 mL glass bottle -rinse bottle and cap three times -fill to top of label -add 20 drops each nitric acid (HNO_3) and potassium dichromate ($K_2Cr_2O_7$) (**Caution:** HNO_3&$K_2Cr_2O_7$ are corrosive)
Phenols	-250 mL glass bottle -do <u>not</u> rinse bottle, preservative has been added -fill to top of label
Radionuclides (as scheduled)	-4 L plastic jug -do <u>not</u> rinse, carrier added -fill to 5 cm from top
Organic Characterization (GC/MS - once per year)	-1 L amber glass bottle; instructions as per organic -250 mL glass bottle -do <u>not</u> rinse bottle -fill completely without bubbles

<u>Steps:</u>

1. Let sampling water tap run for an adequate time to clear the sample line.

2. Record time of day on submission sheet.

3. Record temperature on submission sheet.

4. Fill up all bottles as per instructions.

5. Record chlorine residuals (free, combined and total for treated water only), turbidity and pH on submission sheet.

ii) Distribution Samples (standing water)

General Chemistry	-500 mL plastic bottle (PET 500) -rinse bottle and cap with sample water three times -fill to 2 cm from top
Metals	-500 mL plastic bottle (PET 500) -rinse bottle and cap three times -fill to 2 cm from top -add 10 drops nitric acid (HNO_3) (**Caution:** HNO_3 is corrosive)

Steps:

1. Record time of day on submission sheet.
2. Place bucket under tap and open cold water.
3. Fill to predetermined volume.
4. After mixing the water, record the temperature on the submission sheet.
5. Fill general chemistry and metals bottles.
6. Record chlorine residuals (free, combined and total), turbidity and pH on submission sheet.

iii) Distribution Samples (free flow)

General Chemistry	-500 mL plastic bottle (PET 500) -rinse bottle and cap with sample water three times -fill to 2 cm from top
Bacteriological	-250 mL plastic bottle with white seal on cap -do <u>not</u> rinse bottle, preservative has been added -avoid touching bottle neck or inside of cap -fill to top of red label as marked

Metals	-500 mL plastic bottle (PET 500) -rinse bottle and cap three times -fill to 2 cm from top -add 10 drops nitric acid HNO_3 (**Caution:** HNO_3 is corrosive)
Volatiles (duplicate) (OPOPUP)	-45 mL glass vial with septum (teflon side must be in contact with sample) -do <u>not</u> rinse bottle, preservative has been added -fill bottle completely without bubbles
Organics (OWOC) (OAPAHX)	-1 L amber glass bottle per scan -do <u>not</u> rinse bottle -fill to 2 cm from top

<u>Steps:</u>

1. Record time of day on submission sheet.

2. Let cold water flow for five minutes.

3. Record temperature on submission sheet.

4. Fill all bottles as per instructions.

5. Record chlorine residuals (free, combined and total), turbidity and pH on submission sheet.